RadioSporting

Monthly Magazine for Competitive and Active HAMs

April/May 1989 | 8905 | No. 31 | $2.00

...and she still can not hear him! Either her hat is too big, or he does not have enough elements. It happens at Hamvention!

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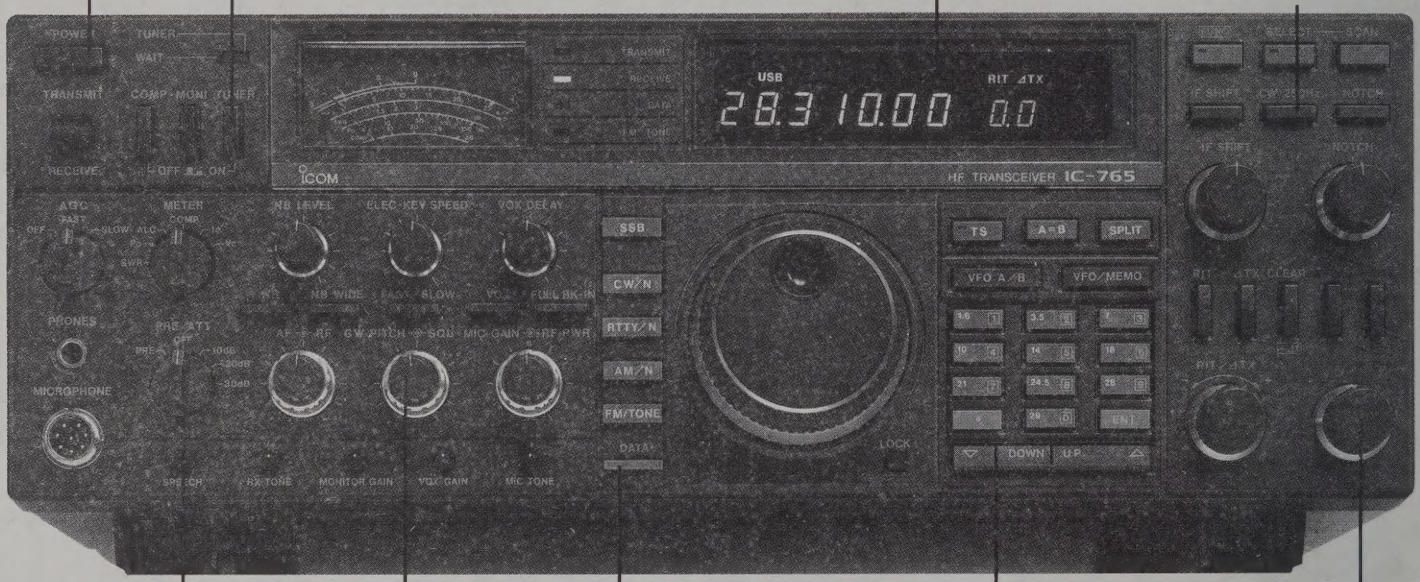

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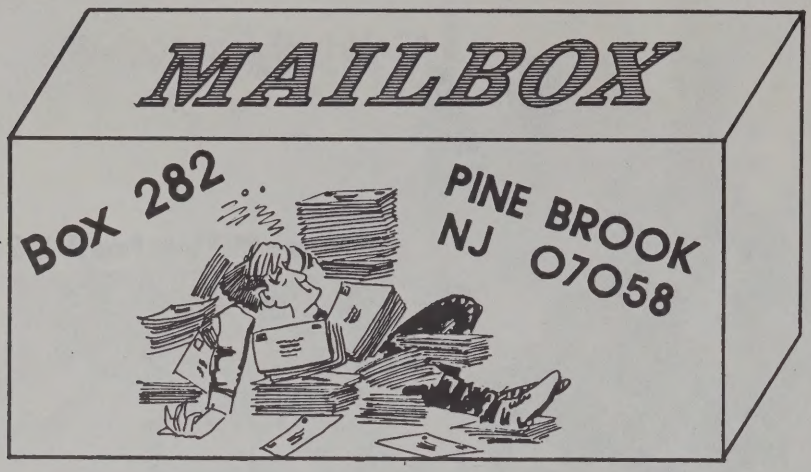

Dear Yuri

I hope you are getting squared away on your moving and business now - I know the feeling. I miss RadioSporting. It is the best reading I ever received - 100% good articles and no "junk fill." 73, Jim McLean, K4XO

Dear VE3BMV,

thank you for sending me the back issues of RadioSporting with W2PV presentation. It was great, I thoroughly enjoyed it. I think I learned more from those issues regarding practical antenna info than of most any source.

I wonder if you are still involved with the Quad/Yagi monoband production. I've always heard good things about them but actually have never talked with anyone using one! Incidently I'm not contester or DX pileup chaser but have always been interested in antennas. Most of my operating is on 10 and 15 meters into Europe and as you can guess from the West Coast it takes pretty good punch. I'm using KLM monobanders at 84 and 72 feet currently.

I am looking forward to reading more about your Razor Beams in RadioSporting.

Thomas Freed, KY6O

Dear Yuri,

Thank you for your letter and my DX Centurion Award No. 6. I have a number of award certificates on my wall but you may be sure that DXCA No.6 is the most beautiful. It looks like a certificate should look. I was surprised to be so high on list. I have the copies of the revised DXCA country list and I am passing it around to my friends in Mexico and Texas. Jack Ingram, XE1JIW

The Windom:

That was an interesting talk by KN8Z about Windy Windom. But there are some provocative statements in your introduction to it! When fed at one-third from the end it is a "VS1AA tap." Windy's tap was 14% from the center, and that resulted in essentially a one-band antenna. In 1936 Jim McIntosh, VS1AA introduced the idea of making the tap at one third on the way along, and using thinner wire for the feeder, producing a 4-band antenna with a 138' top (the one-third tap has an impedance of about 500 ohms on 3.5, 7, 14 and 28 MHz, but when 21 MHz arrived, the VS1AA tap was at high impedance point on that band). I talked with Jim when he was GM3IAA, and his comment on the so-called "300 ohm twinlead fed Windom multiband antenna" would not be printable. Anything will radiate when the system is matched with a decent transmatch, but that doesn't make it a Windom. It would be interesting if someone could look up Windy's original article in the 1929 QST, because I think the advent of the "300 ohm twinlead Windom" (one version of which even had twinlead for the top, as a folded dipole) gave rise to some myth about Windom that should be put to rest. I for one would be interested in seeing a reprint of the original QST article. The G5RV has suffered from some myths too, but at least Louis Varney (at the moment CX5RV) is alive to comment on them. Bob Eldridge, VE7BS

I apologize for any distortion I may have contributed by my statement. I wasn't even born when the above mentioned antennas were deigned and similarity between them makes it easy to confuse them. Actual difference between Windom and VS1AA is 2.67% as far as the location of the tap goes (33.33% vs. 50-14%).

Thanks for your comments and we would like to have some articles from you about the good old days, when hams new the morse code and were gentlemen.73, Yuri

Mr. Jim Smith, VK9NS

Smith, you really have become a bore. Just who do you think you are, Mother Teresa of the ham bands? Savior to wimps and the downtrodden. Your "take charge" attitude with the 4WØPA operation was and is reprehensible, as there are still thousands of us who regard the shooting animals in the ZOOs as vaguely antisocial, even unsportsmanlike. You and your South American counterpart "Eva the Magnificent" are corrupting the sport of DXing, promoting the fraudulent pursuit of what was one time, an honorable achievement, namely, Honor Roll. Among true blue DXers you and your kind are laughingly referred to as the "fat madams of the DX brothels" who along with a retinue of DX-pimps, hustle lazy and or novice operators with promises of QSL cards and radio hardware. You are not promoting operating skills nor antenna and equipment design, but rather reducing the sport of DXing to a preoccupation for the functionally inadequate.

Consider the analogy: Should the guy with the VW Beetle be allowed to enter the "Indy 500"? I say, sure, but when he loses, nobody wants to hear him beefing about unfair competition. Right?

Now, if you are going to whine that 4W "Hans" needed help, then who were you going to help? Dr. Hans is no fool, his degree will or should indicate that! His CW effort was worthy praise. Naturally one might expect a clumsy effort in the early stages, but he would quickly improve, and did, under fire... they all do, when given a chance, and when not permanently crippled by pompous "take charge" List Takers, like yourself.

Face it Smith, you are not needed! We all appreciate your DXpeditions, but your "list" operations serve nobody but your flatulent ego! Ah, vanitas, vanitatum!

So, when a guy with a hundred watts and an indoor dipole works a "rare one" on a list, he only demonstrates the obvious; i.e., that RF, as Marconi proved a century ago, can go around the world.

I don't want to believe it, but I'm told that "list takers" also buy Marlin carcasses at the fish market, stuff them, and hang them in their trophy rooms.

You are destroying the sport of DXing, Smith. Now is the time to butt-out. And do it before the Honor Roll becomes totally meaningless.

Don Newlands, VE3HGN

Subscribers to RadioSporting magazine received a surprise Christmas present in the form of another issue of what many had believed might have gone to ham magazine heaven. Among the articles is a feature by KQ2M, better known as hired gun at KM1H, who expounds on the present day contest operating practices. Among other remarks he complains that some "unethical" operators move within 100 Hz of another station's run frequency on CW and try to take over. For someone who started contesting 35 years ago, this business of holding on to a run frequency for dear life is somewhat mystifying. The question is, as far as I'm concerned, what a particular operator assumes to be the bandwidth of the space he "owns" by right of prior occupancy. Some operators on CW seem to think they deserve 500 Hz on either side to be exclusively cleared for them, and anyone moving in 400 Hz away is immediately told "QRL". They seem to forget that a big part of what makes a top operator is the ability to copy through QRM, and to me, such bellyaching by a top operator takes on somewhat the cast of sour grapes. Not to mention the fact that a "QRL" or even "?" sent without a callsign ID is a violation of FCC regulations, not to mention a "frequency in use" comment on phone without accompanying ID. Let's just say that I feel a new contest "ethic" has grown around me without my consent. I don't feel duty-bound to follow it. Anyone else care to comment?

73, Fred Laun, K3ZO (PVRC Bulletin)

Say You Saw It In Radiosporting

Radiotorial

VE3BMV/W2
Yuri Blanarovich

Editor/Publisher
Radiosporting Magazine

Here it is, another issue of your favorite magazine. We changed frequencies over the past years. From once a month, through about twice a year and with this issue, it would be about quarterly. As they say in the software business: "real soon now" we are gearing to be back on monthly frequency with this issue. I have upgraded my software packages and found that my good old IBM AT "pushed" to 9 MHz clock speed could not hack it. At least I could not, waiting for the screens to refresh. So I decided to go for super-duper 386 board running almost on 15 meter band (finally I have a computer that could help me to be faster in the contest). What a difference and what a problems. Trying to get some new programs and font making software to work with all of this, I found myself loosing about a month's worth of time. Workload, taxes and problems did not go away and time flies so fast.

Anyway, hardware is all talking to each other now, software is almost up and running and we should be getting back to our normal monthly frequency. I know some of you already thought that RadioSporting went to ham radio heaven. But those who fought VE3BMV on the contest battlefields know that he never gives up and fights until he achieves his goal. I thank you all who stuck with us and I hope and promise that you will be rewarded with better magazine in days to come. We are making steps to improve the efficiency, quality and who knows maybe even frequency.

Due to our software/hardware problems we had to leave out WRC Contest results, KH6BZF Propagation Column, SWL Corner and few other things. We should have it all back in the next issue.

No Code License

Is the talk of radio town. "Industry" really wants it. This movement is driven by the desire to sell stuff. The other reason stated is that we need to populate the VHF/UHF bands, so we don't lose them.

Mr. Green keeps writing that we are slipping behind in the technology because we do not have no code licenses, like they do in Japan. His reasoning is that if you give everybody ham radio license, they will go and study electronics and we will start manufacturing VCRs and other electronic gadgets. Bolderdash!

I think that the problem with losing the technological edge, manufacturing capabilities and sinking in the deficit lies a lot deeper than just giving ham radio licenses away. The basic problem is with schooling and with the way this society treats engineers and technicians. Being one I can tell some horror stories from my own experience. Knowing where I would end up, I would have taken studying law or medicine. Japanese industry is where it is because they produce more engineers than layers. This is not because they were all born with walkie talkies and no code licenses. This is because of their culture, family structure, hard working mentality and determination to get ahead.

We had a CB craze here, why didn't we have explosion of electronic industry? Because the idiots got in and spoiled it for all decent CB operators. Today CB is the trucker radio.

You can't force someone to enjoy something. As they say, you can lead the horse to the water, but you can't make him to be a ham. If we want people to get interested in ham radio, we have to treat and publicize our hobby/sport as the noble and responsible one. Those that are crying about decline of growth (we are still growing, but not as fast as some would like) are guilty themselves of not promoting and publicizing ham radio to the extend it deserves. How many times have you seen mention of ham radio contest or its winners in the mass media?. I see idiots eating spaghetti, jumping over the cars, but ham radio - the vital link in disasters is the best kept secret, quite often confused with CB.

Another thing we have now, is the competition from the computers and other electronics gadgets. Lets face it, they are more fun than ham radio. Ham radio lost its appeal from what it had 30 - 60 years ago. Then it was the thing that got the electronics industry going. Today, it is an old hat and the computer technology took over. I can see that with my own boys. Computer is more fun, faster response and more useful for their school work and play. I would love to operate one day multi station with my sons. Will I live to see that day? I hope so. If not, I will not force them "to enjoy" ham radio, I can lead them to the water, but...

I would rather see that we make ham radio more attractive, prestigious and publicized among the "normal" people. We should have more exposure and present the ham radio also as a sport. Our magazine is trying to do that, our IRSA was established just for that purpose. Some people joined us, for what we are extremely thankful and appreciate your support. Some chose to "compete." Anyone who believes in our philosophy, please join us and ask how you can help. We have ideas and programs and we need your help.

As far as no code license goes, theoretically it should help our growth. If we want to establish the lowest class with no code exams, this should be perhaps limited to 430 MHz and above and with limited power, lets say no more than 100 W. I would go for that.

To those who say that CW is obsolete, I say garbage! There is no mode that can beat CW in weak signal reception. When you show me one that will do it, I will forget all the dits and dahs immediately! I personally enjoy operating CW more than phone, there is less garbage on CW bands and CW QRM fighting capabilities are unmatched. I will get through on CW when all the other modes will fail. CW also separates quick talking artists from a real hard boiled ham. On phone you can say things faster, it is more convenient for the conversation, but CW will get you stuff that is not there on phone, RTTY etc.

To those that think that no code license will be the panacea to having the ham radio explosion, I think they are off. In Canada they have "digital" license where code is not required. The PhDs and all them electrogeniuses fought really hard for it. The result? Look in the Callbook and see how many VE stations you find with class "3" which is the digital license. Probably about 10 in the whole of Canada.

Wasn't the Novice class in the US supposed to bring the waves of new hams in, expose them to real stuff and see them upgrading? "Industry" agrees that it did not work out as expected. Now we want to try another "magic" solution.

My thinking is that we should make that water attractive, interesting and give it respect it deserves. Horses will come galloping. If that water is polluted with garbage, full of RFI and legal antitower suits, who wants to drink it even for free? The leaders of "ham radio industry" should be concerned with making our hobby better, more interesting and enjoyable. Then the newcomers will come and also we will stay. If idiots take over, the immediate surge in buying might be there, but we will end up just like the CB band did. Isn't one real example enough? Just tune on 80 m and listen to some garbage there already. Self policing does not work with everybody. FCC is understaffed and underpaid.

I can see that no code license could be useful as a communicator class for those that desire short distance communication with their family members, fooling around with computers, etc. For that we should utilize the 430 MHz and above. This is ideal for the local communication (CBers should have been put there in the first place), again, they should have limited power and we should leave a segments of the bands for CW and other "outmoded" modes.

What would be the next demand from the lazy bunch when no code doesn't work? Get down on HF with no code and kilowatts? There will be more of them by then and they will outvote them CW nuts! What you think?

We welcome the opening of another WARC band - 17 meters. Just a remainder that our DXCA award recognizes countries worked on WARC bands. If you have a 100 countries or more please submit your application. DXCA award is a beautiful, personalized certificate, worth hanging in the prominent place in your shack. Don't worry that ARRL does not recommend to "compete" on new bands. They are wrong, and sooner or later they will change their mind. Starting with our next issue we will list all the DXCA holders and publish current standing on all bands.

Dayton is here and also Ukrainian (Greek, etc.) Easter this weekend. I hope to see you all there on Friday and Saturday, shake a hand and hear your beef. Anyone wishing to help with workload or financially, please do so. We need true blue hams, your input, articles, promotion or anything to make this magazine your best ham radio reading. Thanks again for your patience and see you in Dayton or on the bands soon.

73 de Yuri

DX News

N2SS
Tony Gargano
26 Winchester Dr.
Sewell, NJ 08012

DXAC NEWS

I1RBJ has sent a letter to Don Search requesting a ruling on country status for the territory of Basilica Del Santo. The claim is that the Concordat between Italy and the Vatican, establishing the sovereignty of the Vatican, specifically provides for and includes the Basilica Del Santo. The basis then is that the Basilica, which is located in northern Italy near Verona, is a territory of the Vatican and is far enough away from Vatican City to count separately. Don wrote back to Paul detailing some of the additional documentation that will be required and advised him the matter will be passed to the DXAC for action. Stay tuned for further details.

In his letter, I1RBJ also advised that he has verbal permission to operate from 7O, South Yemen. He expects to have the license in hand by the end of May. He claims he was even asked what call sign he wanted!? He hasn't decided yet between 7OØA or 7O1RBJ. End of June, early July is the planned time frame.

Reminder: several of you have asked me about submission dates for cards for 3D2, Rotuma. June 1st is the magic date. Check your records and QSL cards. If your earlier credit for 3D2, Fiji, was gained by submitting a Rotuma card, resubmit a Fiji card to validate your Fiji credit. And in case you are wondering, cards for 4J, M-V Island have been OK to submit since April 1st.

3D2, Rotuma

5W1GP was to be on. He had planned a week-long operation beginning April 6. QSL direct to 5W1GP.

4J, Malyj Vysotskij Isl

DXpedition should be on May 22-30 with Finish and Soviet operators.

4WØPA, Yemen

Dr. Hans Schouenberg has been thrown out of Yemen, equipment has been confiscated, he lost his job and is now back in Holland after being interrogated by Yemeni secret police for allegedly communicating with enemy - 4X4 stations. The originals of his operating permission and license have been confiscate and Hans did not have copies made. He is hoping to obtain duplicate from the Yemeni embassy in Hague. Anyone wishing to help, please contact PA3CXC.

7J1ADJ, Ogasawara

should be back in early May.

7P8, Lesotho

7P8EG can be found most evenings at 0245-0445Z transmitting around 7.060 MHz and listening at 7.154 MHz. QSL directly to Sam at Box 7583, Maseru 100, Lesotho.

7X, Alegeria

7X3DA has been showing up on 7.010-20 at 0600Z.

9M2EG, Malaysia

workable on long path on 14187 around 1100Z. 9M2FR has a good signal on direct path. QSL to CBA.

AH9AC, Wake Isl.

active on 28350 from 2100Z. QSL via W1ISD.

AP2ZR, Pakistan

active on 14220 from 0230Z, QSYs to 14022 for CW. QSL to 89 CBA.

AP2TN regularly looks for USA on 28.010 MHz from 1230-1330Z and on 7.010 MHz from 0100-0200Z.

BY4AA, China

is regular near 14180 for an hour or two from 1100Z, club station with various operators. QSL via CBA.

C9MKT, Mozambique

will be active two weekends in May: 12-14 and 19-21.

CEØFFD, Easter Isl.

is on around 28005 from 2030Z, QSL to 89 CBA.

EP2DL, Iran

active with EP2HZ around 14160 from 0200. QSL both to Hassan, Box 16765, 3133 Tehran, Iran.

FOØ, Austral Isl.

Having completed their contest operation in the adjacent Marquesas Isl., F2CW and F6EXV are now on Rorutu Isl. signing FOØCW/A and FOØDX/A on 10-160 m with CW about 10 kHz and SSB in the usual DX spots.

Both of these island groups are under consideration for new DXCC country status.

QSLs for this operation go to:

French DX Foundation, Box 88, F-35170 Bruz, FRANCE

J52US, Guinea Bissau

is on daily around 14195 from 2300Z, from 0100 he works on RTTY. QSL via WA8JOC.

JX7DFA, Jan Mayen

will be active until Oct. 10 with some SSB, mostly CQ. QSL via LA8KD.

JX1UG is back at his original location on the West side of the island and will emphasize 160 until his departure. He expects to return there this Fall. QSL via LA5NM.

KC6JC, E. Caroline

Fr. Cav often near 14225 from 1030Z, enjoys talking about his work. QSL via CBA.

LG5LG, Morokulien

will be activated during CQ WPX CW contest by LA2VDA on 20 m single band. QSL via LA9DFA.

LU2ZC, S. Shetland Isl.

Felix, LU2ZC is on around bottom 35 kHz on 20, 15 and 10 m. QSL via Grupo Argentino de CW, PO Box 9, 1875 Wilde, Argentina.

P29RE, Papua New Guinea

is YL Rhonda active around 28500 from 0100Z. QSL CBA.

T3Ø, West Kiribati

VK9NS is going to Ocean Island in the West Kiribati group later in April where he will be signing T33JS. Jim is applying for separate country status for this one.

T5, Somalia

T5GG can't seem to make up his mind. He's been very active on 7.001 MHz at 0300Z, 14.015 MHz at 0400Z and 21.320 MHz at 2100Z sometimes as T5GG and sometimes as 6O1GG. QSL to I2MQP.

TU4CO, Ivory Coast

will be active until the May 31, also shows up on 18070 and 21900 between 1400 and 2100Z. QSL via TU2KC, after May 31 to: A.Tirelli, BP 7 Merlevenez, 56700 Hennebont, France.

TY, Benin

was on by DJ6SI with XYL DJ6JC as TY9SI and TY9YL. QSL to DJ6SI.

UA1POL, North Pole

at the Vyagach Polar Station on 7030 at 0815Z until June 1. QSL via UZ1OWA.

VKØ, Macquarie Isl.

will be active on all bands for a few months by VKØAK, VKØDS and VKØGC

VP8, Falkland Isl.

VP8NJ, PU, QG, QJ, WA and ZV meet with their QSL manager WA4JQS on Sundays at 28403 at 2000Z. Following log extracts they are QRV. WA4JQS new address: Tony DePrato, PO Box 131, Ferguson, KY 42533.

VP8, South Georgia

VP8BUB pops up occasionally on 28.470 MHz around 1600Z.

XF4, Revilla Gigedo

a major all-band DXpedition signing XF4L will be activated by OH2BH and six other operators from April 11 to 19. QSLs will be handled by OH2BN. (OH2BH will not participate, he broke his ankle while in US.)

ZK, S. Cook Isl.

ZK1XH has been very active on 14.290 MHz and on 28.525 MHz. QSL to HB9CUY.

ZS8MI, Marion Isl.

by Peter, ZS6PT is on around 14145 and 14010 listening up, and should stay on the island for about ten months. QSL to ZS6PT.

ZYØSW, St. Peter and Paul Rocks

DXpedition by the Natal DX group will begin operation on May 3 for one week. on SSB they will use ZYØSS and on RTTY ZYØSY. QSL and donation to be sent to: The Natal DX Group, Caixa Postal 597, 59021 Natal, RN, Brazil.

Check our DXCA Award!

Say You Saw It In Radiosporting

KCDXC Dayton Activities

The KCDXC Dayton Hospitality Suite activities have changed this year. The ZERO boys will share suite 525 at Stouffers with the Southeastern DX Association. Friday night SEDXA will operate the suite while on Saturday night the KCDXC will be the host. However both nights the KCDXC will operate its usual special activities in the adjoining rooms to the main suite. the annual CW pile up contest will be held for serious CW types. KØRWL will be at the controls of the contest this year. The KCDXC famous video shows will be held at the opposite room. NXØI will be in charge of the KCDXC operations. Don't miss it! The ZERO boys produce the most fun in radioland. Be there!

John Kanode, N4MM

Congratulations to John, N4MM on his election as Director of the Roanoke Division of ARRL. John has been active for over 36 years and has held various positions on the ARRL committees and for the past 8 years served as Vice Director of the Division.

Active DXer and contester, John is past president of Potomac Valley Radio Club and National Capitol DX Assn. He is active on all bands 1.8 through 432 MHz and holds over 400 operating awards.

It good to see active and knowledgeable amateur on the ARRL board.

Silent Key

Bill Eitel, W6UF

One of the radio pioneers has left our ranks on Feb. 26, 1989. He was 81 years old and lost the battle with cancer. Amateur Radio was very important to Bill, and Bill was very important to Amateur Radio. He was a pioneer 10 m DXer and a superb high speed CW operator. W6TC was an enthusiastic ham and a great man.

In 1934, Bill joined with another enthusiastic amateur, Jack McCullough, to found Eitel-McCullough Inc. on a $5000 stake and the dream that they could build more powerful and reliable vacuum tubes that would operate at higher frequencies than anything then available.

Their tubes, although originally designed for amateur radio use, were quickly adopted for commercial and military transmitters and led to important advancements in radio communications. "EIMAC" as the new company was known, went on to become one of America's leading producers of electron tubes and related devices.

In the postwar years, EIMAC met the challenge of decreasing military sales by generating a host of new commercial products with superior performance characteristics. These new transmitting tubes found applications in such markets as telephone and maritime communications, television broadcasting, aircraft guidance, data networks, and satellite links.

EIMAC never forgot its amateur radio beginnings. Under Bill Eitel's leadership, it continued to provide technical data and equipment to radio amateurs world-wide for many years. This included the early years of space communications, when the EIMAC radio club successfully reflected radio beams off the surface of the moon. Mr. Eitel played a key role in Project Oscar which resulted in the 1965 launch of Oscar IV, the second amateur radio repeater satellite from Cape Kennedy.

In August 1965, Eimac was merged into another pioneering Silicon Valley electron tube manufacturer, Varian Associates, and its locations in San Carlos, CA and Salt Lake City, became Varian divisions, designations they retain to this day. At the time, Eimac had approximately 1800 employees and sales of $28 million, while Varian employed 3600 and had sales of $54 million, hence the transaction increased Varian's size by 50%.

Born January 16, 1908, in San Jose, CA, Bill was a high school graduate who studied radio through the University of California extension Service before going on to successful business career and co-founding the company that bore his name. he served on Varian's board of directors from 1965 until his retirement in 1974 and remained a director emeritus of the company. Over the years, he never lost his inventor's curiosity, installing a fully outfitted laboratory at his Nevada retirement home where he continued to work on ideas that interested him.

Today Varian Associates Inc. is a diversified high-technology company with some 12000 employees and 1988 sales of 1.2 billion, produces systems and components for communications, defense, scientific, medical and industrial markets worldwide. (George Badger, W6TC)

QSL INFO

3D2EW	via	HB9CUY
5H3BH		SMØEAI
5H3RB		NM2R
5Z4FJ		N6QAS
7P8OP		W8JBI
9H3AM		G3VLX
9Q5UN		OH3GZ
A22RA		ZS5ABT
A35KK		SM7PKK
A35MJ		KS7D
A35UF		DL5UF
C45A		5B4SA
FG5BP		KA3DSW
FH5EG		F6EZV
FOØBEF		FE1JCN
JW6NW		LA5NM
JX1UG		LA5NM
K9BO/Z2		N9BHW
KC6NW		DF6FK
LW1EZK		LU6EF
OD5KS		HB9EYA
P33ES		5B4ES
PYØFF		W9VA
RF6QAI		UF6FFF
S79M		JI3ERV
S79M		JI3ERV
TA3/KC3RE		K3BEQ
TL8HW		WB4LFM
VP8BUO		GØIHK
VU7JX		W2XP
XX9KA		KC9V
YJØRY		OH1RY
YJ8JS		N4EVS
ZK1DD		G3MCN

Thanks: Long Island DX Bulletin, Westlink Report, FRC Packet network and KCDXC Bulletin.

1989 Dayton Award Winners Chosen

Phil Thomas, KA8KEJ

The Dayton Amateur Radio Association's Hamvention Awards Committee has named Westlink Report's Bill Pasternak, WA6ITF of Saugus, California as its 1989 Radio Amateur of the Year. The announcement was made on March 28 by Hamvention General Chairman Bill McNabb, WD8SAY.

Bill was chosen Radio Amateur of the Year based on his continuing interest in the promotion of amateur radio, his direct participation in the Westlink Amateur Radio News, the author of amateur radio articles and books and as the producer of amateur radio related videos, including "The new World of Amateur Radio."

The 1989 DARA Specific Achievement Award goes to Phil Karn, KA9Q for his work in the development of packet radio software and his numerous writings on the use of computers in amateur radio. Karn was also recognized for his ongoing technical volunteer work with AMSAT - North America.

Chosen as the winner of the Technical Excellence award is Byron Goodman, W1DX. Byron was chosen for this honor because of his involvement in the early days of the development of amateur radio single sideband communication and for his founding of the ARRL DXCC program.

Presentations will be made at the annual DARA Awards Banquet that will take place on Saturday evening, April 29 at the newly refurbished Dayton Convention Center in downtown Dayton, OH. The 1984 Radio Amateur of the Year, Dave Bell, W6AQ is scheduled to be the evening's keynote speaker.

• Now forming is the ***Little Big Horn Amateur Radio Organization*** (LBH), a group of American Indian amateur radio operators and hams of other ethnic backgrounds who are banding together to build bridges of understanding, friendship and respect via amateur radio. Although not limited to Native Americans, LBH currently includes members from many different Indian tribes. They meet each Sunday on CW on 14.057 MHz at 2200 UTC and 21.150 MHz at 2230 UTC. Listen for "CQ LBH."

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QSN

FREQ	CALL	TimeZ
1831	AH6IQ	0837
1826	FOØCW/M	1029
1832	HK1AMW	0953
1833	K4LTA/J8	0418
1833	KH6JEB/KH7	1037
1830	KP2A/KP5	0319
1830	KX6DC	1116
1831	LU5HJC	0949
1831	PY1BVY	0213
1833	PY1RO	2339
1832	PZ1DT	0521
1836	V31BB	0244
1831	ZD8IAN	0015
1831	ZL2ANR	0840
3795	FOØEXV/M	0756
3799	HL9RH	1126
3800	JA6XMM	1057
3800	KH6JEB/KH7	0840
3507	KP2A/KP5	0205
3795	KP2A/KP5	0121
3500	T5GG	0143
3798	VK2CWG	0959
3798	VK3DZM	1102
3501	YO9HP	2310
3505	ZL1AJM	0848
7004	3B8CF	0203
7003	5W1UY	1156
7007	6W6JX	0632
7020	7X3DA	0559
7001	8Q7HH	0045
7002	9J2BO	0343
7005	9Q5DX	2309
7012	9X5AA	0455
7007	A35AR	1123
7005	A35UF	1228
7004	CEØZIG	0248
7050	FG9DX	1049
7074	FKØAW	0939
7003	FO/HB9CUY	1145
7004	FOØAQ	0506
7001	FOØCW/M	0654
7005	K4SXT/DU3	1204
7009	KC6MS	1232
7163	KH6JEB/KH7	0658
7004	KP2A/KP5	1040
7053	OX1O	0741
7003	PR8BNP	0922
7005	PZ1AV	0830
7001	S79M	2255
7010	S83DD	0416
7002	SV9/I4GBZ	2358
7000	SY8MO	0538
7002	T5GG	0359
7061	T77V	0332
7011	UAØZDN	1129
7008	UL8LWO	0131
7007	V31GS	0433
7001	VK6RZ	2301
7005	VQ9QM	0013
7005	VU2FWW	0036
7001	VU2JN	0057
7003	VU7NRO	0125
7002	ZB2FK	0539
7007	ZD8IA	0100
7188	ZL1APW	1019
7006	ZL1LS	0909
14222	3D2AG	0639
14013	4S7CF	0117
14010	4S7EA	0008
14020	4S7NE	0128
14016	4U1UN	0314
14017	4X1KM	0435
14202	5B4SA	0309
14012	5NØHK	0705
14267	5W1HT	1018
14222	5W1SB	0640
14190	5W1UY	0846
14025	6O1GG	0440
14029	8Q7MR	0151
14168	8R1AH	0652
14026	9J2KF	0132
14192	9M2FR	2319
14013	A35IC	1313
14191	A41JW	1250
14198	A41KC	1256
14189	AP2MQ	0226
14210	C45A	2126
14023	C56/G3SXW	0248
14187	CN8EK	0143
14184	D44BC	0458
14188	DF9FA/4S7	0124
14026	DJ6AS/J4	0507
14026	DL4MBE/H5	2125
14192	EL2JM	0732
14294	FKØAW	1017
14222	FK8EB	0639
14219	FK8ET	0734
14224	FO/DK7UY	0925
14001	FO/HB9CUY	0356
14244	FOØBEF	1031
14005	FOØCW/M	0958
14145	FOØEXV/M	1211
14170	FO5JV	0605
14020	FT4ZE	0149
14165	G4DWU/DU2	1255
14200	H44/DL2GOC	1218
14161	HL6RH	1214
14165	HL9AP	1256
14161	HL9RH	1214
14013	JY9SR	0305
14025	K4LTA/J8	1200
14024	KP2A/KP5	1322
14262	KX6HN	1034
14027	LW1EZK	0129
14269	OHØNAW	2137
14180	P4ØV	0223
14024	PAØGAM/ST2	0005
14025	PYØFF	0131
14012	PZ1DY	0149
14027	RA9AAA	0145
14020	RH8DA	0300
14195	RZ9WZA	1227
14005	S77A	0207
14190	S79F	0029
14002	S79M	0346
14219	S92LB	2235
14251	ST2SA	0514
14027	SU1EE	0512
14004	SV1KU	0440
14009	SV9ADH	0538
14026	T5GG	1450
14014	TA3D	0415
14007	TA4A	2255
14003	TK5IU	0304
14189	TU2JL	0413
14008	TU4CO	0550
14194	TY9CR	0425
14083	TY9JC	2154
14223	UA3YF/RJØK	0029
14015	UA9YC/UAØH	0145
14031	UD6DMW	0309
14018	UF6CX	0225
14002	UG6JJ	0428
14223	UI8ZAA	0250
14018	UL8LWO	0312
14030	UM8MK/QRP	0323
14190	V21AJ	0432
14026	V21KJ	1136
14000	V31BB	0244
14197	V31CV	0350
14029	VP8BWL	0057
14010	VQ9QM	0241
14222	VR6KY	0638
14029	VS6UW	1339
14200	VU7APR	0231
14202	VU7JX	1241
14028	YB2BNJ	1254
14188	YIØACC	2351
14165	YJ8JS	1241
14249	Z2/K9BO	0443
14176	ZK1DD	0643
18131	EA9NN	2306
18074	PJ8JT	2058
18141	TU2OP	0141
18071	VK6AKG	0804
18134	XE2JZ	0400
21365	3DAØAH	2202
21311	4G1A/3	1321
21220	4U1VIC	1718
21287	5HØT	0152
21338	5H1HK	1756
21315	5W1HT	0810
21325	6W7OG	0152
21285	7X4AN	2151
21298	8R1AH	0208
21233	9M2HB	0804
21271	9Q5DX	2139
21249	9Q5NW	1914
21351	A35SA	0411
21268	AZ4F	0716
21018	BY1BJ	0100
21014	BY4RSA	0042
21265	BY8AC	1251
21224	C31SB	1820
21022	C56/G3SXW	0228
21294	C9MKT	1830
21253	D44BC	1940
21024	DK6AS/J4	2135
21269	DX1CW	0232
21307	FG5R	0141
21270	FKØAW	0805
21021	FK8FN	0527
21288	FM4EB	2338
21199	FM5DN	0100
21005	FOØCW/M	1032
21295	FOØEXV/M	0717
21329	FO5IW	0812
21254	G3GJQ/5NØ	0205
21245	HL1IQJ	1404
21322	HL9OB	0334
21289	HV3SJ	1714
21309	J52US	0408
21011	JR1FWR/DU1	1225
21209	JT1BG	0033
21023	JT1BR	1437
21338	JT1T	0126
21258	JY4YJ	2026
21322	JY9LC	1517
21353	KC4USV	0815
21216	KH6DW/KS6	2343
21260	KH8/K3SKE	0552
21024	KP2A/KP5	1310
21018	LW1EZK	2303
21308	NY6M/KH2	0643
21251	ON8LS/5NØ	0142
21374	OY9JD	1825
21024	PAØGAM/ST2	2322
21231	RØC	2345
21246	RB8M	0946
21295	S77A	0417
21014	S79M	2351
21026	S79MU	1653
21208	S79T	2334
21030	T5GG	2311
21307	TL8HB	2044
21238	UAØABK	0102
21018	UAØUBG/UA8VB	1258
21018	UAØUBG/UA8V	1305
21009	UF6FHM	1152
21008	UG6GAW	0342
21017	UH8ED	1806
21337	UL7JGX	0155
21284	UM8MCW	1139
21200	VU7APR	1955
21001	VU7JX	2000
21010	VU7NRO/JOS	1731
21005	YBØBAQ	1643
21306	YCØDB	2017
21306	YCØEY	1341
21330	YCØY	1342
24894	F3BC	1622
24960	KH6TQ	2251
24935	KP2A/KP5	1504
24950	KV4AD	1751
24897	OZ1A	1622
24950	TA2AP	1750
28524	3DAØAW	1844
28502	5B4ES	1346
28407	5HØT	2027
28650	5H1HK	1858
28583	5H3RB	1819
28023	5H3TW	1714
28509	5N6RB	2000
28521	5N9GM	1611
28022	5W1HS	0056
28561	5W1HT	0100
28494	5W1HV	2341
28003	9J2BO	1133
28511	9Q5DX	1630
28002	9Q5PL	2117
28422	9X5AA	1918
28494	A35CE	2148
28495	A35DX	0149
28479	A35HK	2146
28021	A35IC	0215
28495	A35UF	2021
28505	AH2AN	2352
28491	AZ4F	2229
28017	BY4RB	0005
28540	C45A	1353
28494	C53FV	0216
28024	C56/G3TXF	1214
28504	CEØDFL	2319
28481	CN8FC	2041
28505	DU1KT	2238
28501	FH5EF	2050
28591	FKØAW	2210
28027	FM5WD	1626
28495	FOØEXV/M	0045
28474	FY4FC	2229
28572	H44MB	2356
28515	HKØBED	1133
28527	HKØHEU	2309
28494	HZ1AB	1824
28038	J2ØRAD	2018
28538	JT1BG	1237
28585	JY9LC	1434
28025	KC6MS	0045
28614	KC6VW	0012
28495	KH6JEB/KH7	2128
28462	KH8/K3SKE	0017
28495	KP2A/KP5	1748
28574	KX6GL	0056
28585	P33ES	1132
28486	P4ØV	1856
28024	PAØGAM/ST2	2013
28549	PZ1AR	2106
28003	S77A	1244
28605	S79T	1950
28521	SV5TS	1655
28574	T77C	1919
28014	TA2AO	1636
28535	TA3D	1623
28558	TEØUP	2247
28501	TR8RLA	2055
28494	TY9CR	1223
28547	UF6VAG	1249
28011	UI8IF	1239
28545	UL8LYA	1351
28481	V29A	1608
29280	V31BB	1944
28010	VU7NRO	1252
28579	YBØTNX	1322
28636	YB1BI	1430
28510	YJ8JS	0016
28312	ZD8BOB	2214
28004	ZD8IAN	2119
28497	ZK1XC	2250
28507	ZPØY	1912
28459	ZS88AOO	1900
50105	J52US	1449

Credit for the above DX callouts on the FRC packet network go to the following operators at the K2SB, K3WW and W3FRY nodes: AA1K, AA3B, AA4II, AD3V, K2BU, K2DOX, K2JF, K2RD, K2SG, K2TD, K2TW, K3ANS, K3AYK, K3GYS, K3IE, K3JGJ, K3ND, K3OO, K3PA, K3UEI, K3VW, K3WJV, K3WW, K3ZA, KA3PIT, KA3PLS, KB4PEF, KD2RE, KE2CG, KF2U, KU3X, KY2T, KY3T, N2AA, N2BP, N2EA, N2FKT, N2GZL, N2LT, N2MM, N2NT, N2SS, N2VW, N3BNA, N3DXY, N3FDL, N3GCC, NE3F, NF2L, NK3U, NM2Y, NN3Q, NT2X, W2FG, W2GD, W2GMA, W2REH, W2YY, W3BGN, W3FRY, W3UM, W3XU, W9NGA, WA2NHA, WA3IJZ, WB2K, WB2P, WB2R, WC2K. That's a new record! 69 stations calling out DX on packet last month.

Special Salute to QRZ DX, W1AW, N2GZL, KY2T. Contribute to your DX column and get the "S" "S".

73, TONY N2SS

Frankfor Radio Club
WARC HONOR ROLL

30 METERS

Call	Countries
K4PJ	129
K2FL	107
W2NS	101
WB2YOF	87
K2QIL	74
W3EVW	72
K3KNH	50
K2JF	15
WB2YOF	12
N3BNA	5
W3NX	2
N2MM	2

12 METERS

W2NS	159
W4PEL	131
K2FL	72
W3NZ	65
K4PJ	57
W3OV	45
K2QIL	36

17 METERS

W2NS	83
W4PEL	47
W3NZ	39
K2FL	34
NY2L	24

WHAT'S WHAT DEPT.

5L	same as	EL
7S3	" "	SM
BZ	" "	BY

QSL

Courtesy of
Long Island DX Bulletin

A22BW via DK3BW
A35BV HB9CVX
A35CE DJ9ZB
A35DX DF2UU
A35JM KS7D
A35PM JA1OEM
A35SA KB7QC
A35UF DL5UF
A41KF A4XKF
A41KP DL7FT
A4KXB N4GNR
A4XGY K2RO
A61AB OE6EEG
AHØB JA2VUP
AHØF JA2NQG
AH2AN W2CBA
AH9AC W1ISD
AMØADE EU3CUU
AM3AM LU2DJY
AP2SQ W3HNK
AP2ZR JA6GDG
ATØHV VU2IAR
ATØN N2AU
ATØT W8XM
ATØV VU2CVP
ATØW WA2YMX
ATØZ W3HNK
AX9LM DJ5CQ
AY4F via LU4FD
AY6D LU1DJU
WBØADO/BV WBØADO
C21BD KA6V
C3ØEAF F6ARA
C3ØEAG F6ELE
C3ØLBT EA1QF
C3ØLFC OH3TQ
C3ØLFQ EA3CCI
C3ØLFR GØAMG
C31LBL EA3DDP
C31SD CT1AMK
C53FV G3YMM
F2CW/C56 F2CW
G3SXW/C56 G3SXW
G3TXF/C56 G3TXF
OZ5QU/C56 OZ5QU
KØGVB/C6A KØGVB
N4FD/C6A N4FD
NQ4I/C6A N4FD
VE3PJH/C6A DL2NCY
C9MKT SM5KDM
CEØFID ON4IZ
CEØICD CE3ESS
CEØMTY CE3ESS
PY1DFF/CEØ PY1ROB
CE2LZN LU9FFA
CE9AM CE3EEO
CO6CD via W3HNK
CQ1DGK via CT1DGK
CRØA W3HNK
CE9A WB2KXA
CT3BZ OH2BH
CT9GEF CT3EE
CUØSM CT1AI
CU2AK W3HNK
CU2ARA AG1K
CU3AD W4PKM
CVØZ CX2CS
CW5A CX5AO
CW8B N7RO
CX6BM CX4VA
CYØZ CX2CS
CZ4XX VE4ACF
OK3TAB/D2A OK3ALE
D2ONU I2DEX
D44DC WA6SL
D68MG W3DJZ
KZ5Z/DU1 NA5U
VS6TK/DU1 N5EIN
K4SXT/DU3 WB4KZW
KE9A/DU3 WB9YXY
DV3YL DU9RG
EAØBAE EA4YW
EA2EE F9RM
EA8AB EA5BS
EA8AGD OH6DK
EA8AK via W3HNK
EA8QS OH5XT
EA9EA EA7LZ
EA9OB EA5BY
K5BDX/EA9 NA5U
KA3V/EA9 NA5U
EDØMA EA7DHO
ED5TI EA5BPY
EE7ITU EA7TH
EI7M EI5FT
EK3ARP UA3PPF
EK81ZN UA9OJ
EL2DK G3DCA
EL2E HB9STZ
EL2FY JA1XAF
EL2JM KA5ZMK
EL2MR WA8LKS
EL2WK G3DCA
EL7FU OH2BN
EL7U OH2BN
EL8BE GM4LDU
EO7LPK UL8PXX
EU2AR W3HNK
EW2ABA UC2ABA
FG5BP KA3DSW
JA2EZD/FG JA2MNB
PAØCRA/FG PAØCRA
KA3DSW/FG5 KA3DSW
FH5EF via F6EZV
FH5EG via F6EZV
FJ5BL F6AJA
PAØCRA/FJ PAØCRA
FKØAW F6BFH
FM4A FM4EB
FM4EB W3HNK
FM5WD W3HNK
FOØBEF FE1JCN
FOØSUG JA2NQG
FO5BI FD6HSI
FP8AW HB9AW
FR4FA F6ESH
FR5ZD FR4ZD
KYØT/FR KYØT
FS5YL W3HNK
GP5BP/FS KA3DSW
JA2EZD/FS JA2MNB
K2BS/FS W2GHK
PAØCRA/FS PAØCRA
FT4ZE F2CW
FT5ZB F6EYS
FYØEK DJ5KQ
FY5EW F6BFH
FY5YE W5JLU
GBØDOG GM4WEW
GB75DX G4BWP
W6RFX/GU W6RFX
WA2TMP/GU NS7F
DL4MBE/H5 via DL3RK
HA9RE HA8XX
HC1MD K8LJG
HC2DZ W3HNK
HC5J NE8Z
HC5M KQ2M
HC1MD/HC5 K8LJG
HC8Q HA8LKE
HD8DX HC2DZ
HD8EX DL7AV
HD8GZ HC2DZ
HD9OT HC1OT
HG6ØHQ HA5FM
HG9R HA9PP
HH2SD KC3VL
KF4G/HH2 KF4G
HH7GE K1DII
HI3YH F6FNU
HI5ØOUD HI8LC
HKØHEU HKØFBF
HLØZG W6DU
HL5BDS HL1ASS
HL9BK K2KSY
HL9EP KØVZR
HL9JZ KA1OXO
HL9OB N4GNR
HP3XUH KA4MVK
JAØDQY/HR3 JH8FAJ
HS1AMT via W2TK
HV3SJ via IØDUD
HX6CDJ Y44IU
HZ1AB K8PYD
N4QIV/IØ W9KBV
W9LT/IØ W9KBV
IAØPS IØJBL
IB8A IK8DOI
IP1ARI I2CZ
IU2A I2UIY
IU4K I4ABF
IU9ARI IT9TQH
IY4PGM I4IKW
J420 SV2WT
J45JG SV1JG
J52US WA8JOC
J6LAH K4PHE
J6LSN KJ8G
F2JD/J6L F6AJA
KJ8G/J6L KJ8G
J73CB WB9MFC
J73LC KF4IL
J79OUT JG1OUT
J79ROJ JG1OUT
F2JD/J7 F6AJA
F2JX/J7 F6AJA
J88AQ W2MIG
J8DX W5PWG
J8OA W5PWG
KB5CBW/J8 via W5PWG
W5PWG/J8 W5PWG
7J1ADI/JD1 VK2AGE
JA2NGG/JD1 JH1LKH
JH7EAY/JD1 JH7EAY
JQ1XAQ/JD1 JG2CLS
JT1T JT1KAA
OK1XC/JT OK1XC
JW2FFA LA5NM
JW5HM LA5NM
JW7PD LA5NM
JW8FC LA8FE
JX1UG LA5NM
JX8KY LA7ZO
JY2ZM WA3HUP
JY4MB DJ3HJ
JY4YJ WB3CQN
JY5CI G4WFZ
JY5DK ON6BY
JY5HH DJ9ZB
JY8BY ON6BY
JY8KL G4KLP
JY8LX ON7LX
JY9SR W3FYT
K6LRU W8ILC
KA1NC K4JEX
KC4AAA NC6J
KC4AAC KE9AS
KC6JW via DL2ZAD
KC6MA via DL2ZAD
KC6MB DF6FK
KC6MF F2CW
KC6MH DF6FK
KC6MS JA2NQG
KC6MZ JA2KVD
KC6NW DF6FK
KC6NX JA2KVD
KC6SI JA7HMZ
KC6SW JA2KVD
KG6MS JA2NQG
KHØAC K7ZA
JE1CKA/KHØ JE1CKA
JHØUSD/KHØ JHØUSD
KB6IRD/KHØ DJ9ZB
KH2D KA3T
IK2GNW/KH2 IK2GNW
KP2Z/KH6 JA5DQH
KH6LW/KH7 KH6JEB
DK1CE/KH8 DJ9ZB
JO3VOZ/KH8 JL3U1X
KP2A N6CW
KP2N K8OHC
W6JD/KP4 W6JD
KP2A/KP5 N6CW
KX6OR AD1S
KX6TY KX6BU
LG5LG G3LNC
LR1V via LU1VZ
LS1V LZ1KZM
LU2ZC GACW
LX2PA PA3DKC
PA3DKC/LX PA3DKC
LY2WR UP1BWR
LY2WW UP1BWW
LY2ZA UP1BZA
LY2ZO UP1BZO
LY2ZZ UP1BZZ
M1Y IØMWI
JH2NL/NHØ JA2KVD
N7DF/NH2 KØHGW
K2SG/NP1 N2AU
N2EDF/NP1 N2AU
NP4G WS4E
NE8Z/OA4 K8LJG
OA7MP K8LJG
OD5TM F6CYU
OD5NL F3SM
OHØBH OH2BH
OHØXX OH2BBM
I2VBS/OHØ I2MQP
OHØMB/OJØ N2AU
OL4A OK BURO
OL8A OK3LZ
ON4KST ON BURO
OX3GH WA2TTI
OX3LX via OZ1DJJ
I2DMK/OX via I2MQP
OY1R W2KF
OY3QN OZ1ACB
W7WA/OY W7WA
P29KN WA4SFQ
P29VMS DL2GAG
P29VOX DF5UG
P4ØAU WA6AUE
P4ØB N2MM
P4ØBC W1YRC
P4ØG NB6G
P4ØGD N2MM
P4ØGO K5GO
P4ØI K7RIE
P4ØP N1CIX
P4ØS K7SS
P4ØSV VE7SV
P4ØV AI6V
P4ØX KA1XN
P4ØZZ KE7V
K7RIE/P4 K7RIE
KB5FFE/P4 P43GR
PA6CC PA3BAG
PJØJ K4PI
PJØK NK4U
PJØM K2MUB
PJØR N5RM
PJ1B K2SB
PJ1W via NX4N
PJ2FR KI6EZ
PJ2J K1CPJ
PJ2X KQ1F
AA4GM/PJ2 NK4U
K4BIH/PJ2 NK4U
W1BIH/PJ2 W1AX
W1WEF/PJ2 W1WEF
W3HHG/PJ2 NK4U
WR4S/PJ2 NK4U
AD8J/PJ4 AD8J
PJ8JP AB1U
PJ9JT W1AX
PYØF PY7ZZ
PYØFC PY7XC
PYØFF W9VA
PYØZD PY5XD
PY1ZFO/PYØ W9VA
PP2ZDL/PY8 DL8NU
PZ2AC WA4JTK
PZ5ES KX2O
PZ5YV K3BYU
N3JT/PZ W2GHK
RØBUB UB4UWA
R3EKM UZ3EWD
R8BOU UB5UCH
UC1OWA/RB3M RB4MF
RC2AR W3HNK
RDØD via RA3YG
RA3YG/RDØD via RA3YG
RD3K RA3YG
RF6FKG UF6FFF
RW9WA/RH RW9WA
RI7KU UI8APA
RL1P RL8FYL
RS3A UZ3AXX
RTØU UT4UWV
RV6AB N2ERN
S79D WB4YZU
S79MC AK3F
SJ9WL G3LNC
SN7ØPOZ SP3KKU
SN7ØSUL SP5ZZC
SOØA EA2JG
SO1A EA2JG
SO1MZ EA2JG
SPØPAK SP9FUT
9Y4RD/STØ KA2DDJ
LA1RR/STØ LA1RR
SU1EE WA9INK
SU1EK WA6OWU
SU1ER N6CW
SVØCR WA7QAR
SVØEK N1DSC
SVØFE KØTLM
SVØGC WA6QDR
SVØGM N4FD
DK5AS/SV5 via DJ8MT
NT6P/SV5 WX6Z
SV1RP/SV5 SV1NA
DK7PE/SV9 DK7PE
DL4EBN/SV9 DL4EBN
SZ2COT SV3DXC
T2ØAA N4FJL
T3ØAC AA6BB
T3ØBC ZL2WQ
T3ØJS VK9NS
T31JS VK9NS
T32ZK JJ1TZK
T3ØZK/T32 JJ1TZK
T41CW CO2QQ
T411 CO2QQ
T41N CO2QQ
T46CL CO6AV
T47DX CO7KR
T53RC I2JSB
T5GG I2MQP
T77E IØMWI
T77G IØMWI
T77V G4UCB
T77Y IØMWI
TA1E KA1DE
TA2BK DF2RG
TE2E TI2LCR
TE2R TI2SD
TE2T via TI4SU

Check your label for expiry date!

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6 m Corner

KA3B
Harry Schools

1606 S Newkirk St.
Philadelphia, PA 19145

6 METER MOONBOUNCE

In my quest for information concerning 6 meter Earth Moon Earth (EME), I decided to write Bob Magnini, K6QXY and Mike Staal, K6MYC, two experts in the field. Both came up with informative letters on the subject and I am sure that you'll find the following information very interesting.

6 Meter EME work began in the late 1960's / early 1970's when WA5HNK in Texas and other W5's ran tests with K5CM in Oklahoma. All stations involved utilized fixed yagi arrays pointed at the horizon. Everyone taking part was located at the same longitude, which meant that all stations used a common moon time. Later W7FN in Washington used a fixed 8-bay yagi array to work WB6NMT in California who ran a large stacked rhombic array.

Actually, the first 6 m EME QSO took place on 7-30-72 at 0433 GMT. The participants were WA5HNK and W5SXD in Texas along with K5WVX and W5WAX in Oklahoma, both groups used 48 element arrays (eight 6 element beams) aimed east at the rising moon for horizon gain. The first contact was between W5SXD/5 and WA5HNK and W5WAX/5 with only partial readability. (SEP 72 QST, p. 91)

On September 5th, 1972, K5WVX and WB6NMT extended the 6 m EME distance record to 1480 miles. With signals a few dB above the noise, the QSO took 20 minutes to complete. (NOV 72 QST, p. 115)

In May of 1984, Jim Treybig, W6JKV traveled to Anguilla under the call VP2EME. On this DXpedition, Jim was assisted by WB6SHD and VP2ESE. Utilizing two 50 foot long 11 element yagis designed by K6MYC, moonbounce was attempted with stations in California. These antennas were separated by 24 feet on a horizontal cross-boom and were vertically polarized. Taking advantage of ground gain over a water path, Jim was able to hear K6MYC and K6HCP.

A short time later on July 24, 1984, K6MYC worked K8MMM in Ohio for the current 50 MHz EME DX record. A month or so later, K6HCP worked WA4NJP in Georgia.

Bob K6QXY makes the following observations concerning 6 m EME

1. 17 dBd is the absolute minimum gain required if any reliable results are to be made.
2. Sky Noise is a major problem - 11 times that at 144 MHz.
3. No accurate sky maps exist.
4. Man made noise is very high - especially on the horizon.
5. Ionization in the E and F layers greatly affects results and they are hard to predict.
6. Faraday Rotation is very fast - 1 minute or less.
7. Signals vary greatly in amplitude.

Operating parameters currently utilized

Frequency: 50.010 MHz

Sequencing: 30 second sequencing using CW at 13 - 18 WPM Western-most station transmits first 30 sec.

Stations currently active on 6 meter EME

K6HCP - California - (4) 7 element KLM's AZ/EL

K6QXY - California - (4) 10 element yagis AZ/EL yagis are 1.75 wavelength on 36' boom designed by Roy W6UXN they are computer optimized at about 13.5 DBI and are stacked 24' X 28'.

WA4NJP - Georgia - (4) 8 element yagis AZ/EL yagis are 1.75 wavelength on 36' boom designed by Joe, W1JR. Stacking is 24' x 28

Stations known to be building 6 meter EME arrays

W6JKV - California - (2) 50' or 60' lon yagis AZ/EL

VE6JW - Alberta - (4) 50' yagis AZ/EL

ZL2BGJ - New Zeland - large stacked rhombic array (temp QRT)

ZS6DN - South Africa - large 4, 6, or 8 yagi array.

K6MYC - /KH6 Hawaii - Mike will be moving to Hawaii within the next year. His array will consist of (4) 11 element DL6WU (slightly modified) yagis on 50' booms, spaced 30' wide and 26' high.

Additional 6 meter EME information

In addition to the stations listed above, many others have large arrays on the horizon (terrestrial arrays) which are EME capable. N6CT, K7KV, and K8MMM are just a few that have this capability. Mike K6MYC is currently building high performance yagis for 2 meters and may soon release two or three versions for 6 meters that would be ideal for 6 meter EME arrays. Models with either 40, 50, or 60 foot boom lengths are being considered utilizing lightweight construction and through the boom design. They may be available soon commercially through Mike's company - M2 Enterprises. The address is 1600 Decker Avenue, San Martin, California 95046.

Due to the large size of 6 meter moonbounce arrays, this mode of operation is obviously beyond the means for most who are active on the band. However, we should be indebted to these "few" pioneers who, in the true amateur spirit, exemplify that something special which seems to be a common trait among those actively involved on the 6 meter band. Thanks once again to Mike K6MYC and Bob K6QXY for their cooperation.

Worldwide TV-FM DX Association.

Many of the DX chasers on the 6 meter band are avid MUF watchers. Along these lines, TV DXing seems to be a popular side-hobby amongst 6 meter operators. Whether its tracking the MUF by watching for European signals in the 48 and 49 MHz range or checking our domestic Channel 2 frequency for possible single hop sporadic-E paths, many of the more serious operators on the 6 meter band are actively engaged in this "other" form of DXing. Therefore I have decided to promote the Worldwide TV-FM DX Association. It is a fine organization with many active hams as members. The information presented below was received from their headquarters and should answer some questions that potential members may have concerning club activities.

The Worldwide TV-FM DX Association is anon-profit organization created in 1968. Its purpose is to serve reception enthusiasts (DXers) interested in the VHF-UHF frequency spectrum, which includes television, FM, and various public service and amateur radio bands. WTFDA is a full member club in the Association of North American Radio Clubs (NARC) and is the only club in North America specializing in VHF and UHF DXing, on both the TV and FM broadcast bands. WTFDA is a specialty club; we do not cover the AM broadcast, the shortwave broadcast, or HF amateur and CB radio bands. By concerning itself with only DX activity above 30 MHz, WTFDA delivers to its members a product of quality unattainable in other clubs that cover all radio and TV broadcast bands.

Monthly, we publish the VHF-UHF Digest (VUD) and distribute it to our membership via first class mail. The VUD is an offset printed, booklet format magazine that features many regular columns and special reports which include technical hints and techniques for better long distance reception of TV and FM signals.

If you have an interest in the successful reception of long distance signals on TV and FM, then we believe that WTFDA is for you. Our editorial staff is composed entirely of volunteers, and is a highly qualified crew. All are experienced DXers and many come from impressive backgrounds.

Each month the VUD features in-depth accounts of the latest DX activity. members exchange accounts of recent long distance receptions, and FM and TV news sections keep them up to date on the latest station changes.

A year's membership in WTFDA gets you a copy of the VUD each month. There's also an annual club convention held every summer, giving members a chance to attend technical lectures and share experiences. Dues are $15 per year in N.America, $18 outside of N. America. The address is Worldwide TV-FM Association, Box 514, Buffalo, NY, 14205-0514

TV channels worldwide

Channel	Area	Video	Audio
1	New Zealand	45.25	50.75
A	Ireland	45.75	51.75
0	Australia	46.25	51.75
E2	Europe	48.25	53.75
2	France	49.25	55.75
E2A	Europe	49.75	55.25
R1	USSR	49.75	56.25
C1	PR China	49.75	56.25
B	Ireland	53.75	59.75
A	Italy	53.75	59.25

Say You Saw It In Radiosporting

Antennas

Steerable Wave Antenna.

Enigma to reflect on.

K7VIC and N7SC did some experimenting with W1WCR's steerable wave antenna designs, and their results gave rise to several hours of discussion on 1860 kHz.

There is something which bothered us. A low loss halfwave transmission line shorted at the far end looks like a low impedance at the near end; open at the far end looks like a high impedance at the near end.

On a steerable wave antenna one of the wires is grounded at the far end and the other is open, and the antenna is one or two halfwaves long.

The thing that bothered us is this: The coupling transformer (transformer B on page 11 of Vic's book) is center-tapped to ground.

How can the signal balance out across the primary (with consequent low signal level in coax B) if the upper wire is high impedance to ground and the lower terminal is low impedance. This is not just a theoretical consideration - the question arose from the discovery that most of the signal voltage coming in from off the far end seems to be developed on the wire open at the far end.

We brought this question up in the West Coast 160 Meter Bulletin, and it evoked an interesting reply from Vic.

REFLECTIONS ON THE STEERABLE WAVE ANTENNA ENIGMA

Vic Misek, W1WCR

The enigma of the half wave low loss SWA was brought to my attention by VE7BS. It is the result of astute observations and on-the-air discussions with K7VIC and N7SC. An enigma occurs when persons using their analytic powers arrive at a conclusion which defies reason.

The enigma runs something like this: One SWA wire terminates at the far end in a short circuit. The other in an open circuit. At the receiving end if one measures the impedance with respect to ground of each wire one finds that, as expected, the wire terminated in an open circuit looks very much like an open circuit and the wire terminated in a short circuit looks very much like a short circuit.

It appears that the balanced, center tapped push-pull receiving transformer is operating into an unblanced cock-eyed set of impedances which should render the SWA inoperative.

On the other hand we know that the SWA does operate like it should, so what is going on here? All of the observations referred to above are valid and well reasoned. In fact, the enigma should occur to anyone intensively studying the SWA.

Part of the confusion results because the SWA wires are simultaneously used as an antenna and a transmission line with signals travelling in opposite directions superimposed on one another.

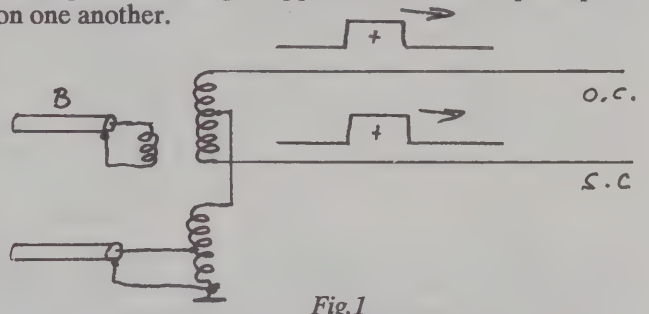

Fig.1

For the purpose of this discussion let's say that the round trip propagation time on the SWA is T seconds. If I input a short pulse at A (figure 1) it takes T seconds for the pulse to travel to the far end, get reflected and travel back to B. I now input a very short pulse at transformer A. The length of the pulse is very short compared to time T. This pulse appears as a positive pulse on both wires in figure 1 and is shown by the arrows to be propagating toward the far end. At this point on the wire the pulses do not know that the o.c. (open circuit) and s.c. (short circuit) terminations exist. The impedance seen by the pulses is the push-push impedance to ground which would exist if the wires were infinitely long. The pulses will experience o.c. and s.c. only when they arrive at the far end.

The amplitudes are equal and the pulse generator is operating into a 50 ohm load.

Upon reflection at the far end the o.c. pulse travels toward the receiver with polarity unchanged (positive). The s.c. pulse undergoes a polarity reversal. Thus the two pulses travel toward the receiver in the push-pull mode, since the electric field is now between the wires instead of from the wires to ground. The reflected pulses are seen at the output of transformer B but cancel in transformer A.

So far everything is working fine with no enigma or impedance mismatch.

To induce the enigma I increase the pulse length at input A to let's say twice the round trip time or 2T. Now let's look at figure 2 to see what causes the open circuit of the enigma.

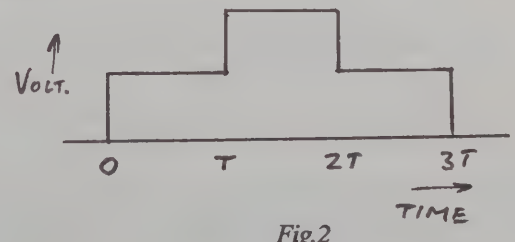

Fig.2

Figure 2 is a plot of the voltage seen at the input end of the o.c. wire when driven by a pulse 2T seconds in length. The impedance seen between times 0 and T is the characteristic impedance of the wire. At time T, however, the front edge of the reflected pulse has completed the round trip. Because the polarity is the same as the transmitted polarity, voltages add and the pulse height rises. Between times T and 2T the input is like an open circuit because the pulse generator is driving in the same direction as the reflection.

The scenario on the s.c. wire is shown in figure 3.

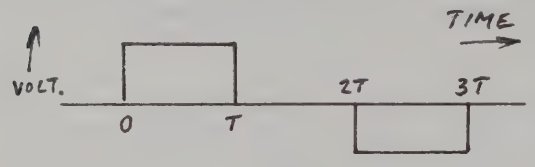

Fig.3

As in figure 2 the impedance seen between 0 and T seconds is the characteristic impedance of the wire. At time T the leading edge of the reflected wave begins to cancel the input voltage since the polarity of the reflection is opposite to that of the pulse generator. Over the interval T to 2T the input impedance appears to be zero (zero voltage at a finite generator current). At 2T the input pulse has terminated leaving the rest of the negative reflection which then terminates at 3T.

In spite of the open and short circuit impedances generated by the pulse and its reflection the reflected pulse is delivered intact into output B. This can be shown by subtracting the plot in figure 3 from that in figure 2. The input impedance at A remains constant throughout the sequence because the reflection is never seen at transformer A. Transformer B sees only the impedance of the transmission line.

In summary it can be stated that the enigma is caused by the linear superposition of antenna mode and transmission line mode signals simultaneously travelling in opposite directions.

The impedance experienced by the travelling wave is not the same as the impedance of the combination of incident and reflected waves as measured on a single SWA wire using a CW signal.

A system correctly matched for a short pulse will also be correctly matched for a long pulse and also for any CW sine wave. The antenna is thus a broadband non-resonant travelling wave device.

(This explanation from Vic was published in the West Coast 160 Bulletin).

THE WAVE ANTENNA
more notes

Bob Eldridge, VE7BS

I noticed a paper in the March 1985 Antennas & Propagation Transactions (IEEE), that should be of interest to anyone seriously interested in Beverage antennas. The details are a bit much for the casual operator, but the conclusions may tweak your interest:

HEIGHT:

The current induced in the antenna by the incoming signal decreases by less than a factor of 2 as the height of the wire is decreased by 10.

GRAZING LENGTH:

With an antenna several wavelengths long there is a broad ripple of current at half wavelength intervals starting from the receiver input transformer. The current then settles down to a mean value somewhat less than the maximum amplitude of the ripple; I interpret "grazing length" as being the point where this settling down occurs (if anyone out there knows otherwise, please tell me!).

The grazing length reduces by a factor of 2 for each 10 times decrease in ground conductivity below the antenna. At higher frequencies the grazing length tends to become proportional to the height of the wire above ground.

GROUND CONDUCTIVITY:

At lower frequencies, ground conductivity is a dominant factor. The current induced in the antenna decreases by a factor of about 2 for each 10 times INCREASE in conductivity. This is a quantitative expression of the commonly recognized fact that Beverage antennas are better over "poor" ground.

FREQUENCY OF OPERATION:

As the frequency increases, induced current decreases by a factor of about 2 for each 10 times increase in frequency.

It is significant that in this paper the calculations for induced current caused by a lateral wave are made assuming a matched load AT BOTH ENDS.

If you want to dig into this very interesting paper (35 Figures and 29 equations), the title is "Time Harmonic Solutions for a Long Horizontal Wire Over the Ground with Grazing Incidence" by Kenneth Chen of Sandia Labs in Albuquerque N.M.

Fred Capossela, K6SSS visited the big tower at K2GL during the birthday party for the late Buz Reeves, K2GL - home of N2AA Multi - Multi superstation. Fred is one of the original crew members of Tuxedo Park contest team.

Propagation

VE3BMV
Yuri Blanarovich

Editor/Publisher
RadioSporting

Here are some more comments relating to my article originally published in CQ Magazine, June 1980 and reprinted in RadioSporting, December 1986. On one hand I get comments that the idea of propagating radio waves on HF by ducting as outlined in my article is ridiculous, on the other hand, that it is nothing new. VE7BS shares the view of the second group. Looking through available literature I could only conclude that the **remarks relating to refraction were applied to VHF/UHF propagation or to the mechanism of "reflection" of HF signals from the ionosphere, which is also interpreted as a refraction at the area of contact.** Almost all the books on propagation talk about radio signals being reflected (refracted) from the ionosphere towards the earth, then reflected (!) back up to ionosphere, and so on. **My big point is that I have found, that we do majority of propagating on HF frequencies by ducting without going "down to earth," in the layers, rather than bouncing between the ionosphere and earth!**

Just about all present publications on propagation describe the propagation on HF as "bouncing" the signal between the ionosphere and earth! Now we are seing some articles allowing for refraction and ducting on HF. Could it be that this was started by my findings and an article in CQ Magazine? I have not seen any credit or refrence to my work. ARRL Handbooks and Antenna Book, are "quietly" slipping in the notes to that effect.

When I got involved in contesting I got my basic propagation education from the literature. My understanding was that we are bouncing signals between the ionosphere and the ground. (Even late Jim Lawson, W2PV believed that.) If there were any references made supporting the refraction and "conduction" or ducting, they mostly referred to VHF/UHF. If they implied that the same is happening on HF frequencies, there were not sure of it or they would have erased those "hopping signals" from the textbooks. Lord Appleton got the Nobel Prize and has been made Lord for discovering the "bouncing" and nobody took it away from him.

Here are the notes from Bob, VE7BS. I hope that with more observations and discussions we get closer to the truth and correct our textbooks as time goes on.

More on propagating waves.

Bob Eldridge, VE7BS

The magazine is very interesting, and takes up more time than anything else I read at the moment!

I am not an expert in propagation, and live 100 miles from a decent library, so can only quote from my own resources. I have looked through the files and the bookshelf and there is plenty of evidence that the "official lore" included refraction etc in the ionosphere back around the time of WW2. The old standby Circular 462 of 1948 explained it so well that if I had thought of looking there first I probably would not have bothered with some of the others - but maybe it is useful to review some of the similar information in the amateur literature.

Here are some references from before 1970 and in the comment on Fred Laun's, K3ZO notes a reference to Albrecht's work in 1957:

RSGB HANDBOOK 1968 discusses refraction, reflection, ducting:

"Refraction can be defined as a gradual change in the direction of propagation caused by progressive changes in the dielectric constant (k) of the medium, which in this case is the earth's atmosphere.

This effect is important close to the earth's surface, up to heights of the order of 1 km or so. ....[causing] dielectric constant to decrease with increasing height. This is the normal condition, and hence there is always some refraction taking place, bending the waves in a favorable direction. The presence of refraction under normal conditions is usually taken into account in propagation calculations by assuming plane geometric propagation in straight lines over an earth having a radius 4/3 that of the actual earth.

If, as occurs under certain weather conditions, there is a sudden diminution of k with height, **Reflection** of the wave will take place at the boundary between the two air masses concerned.....possible for a region to be established in the troposphere in the form of a narrow layer of air of a certain k value trapped between two regions of lower k. This is referred to as a **Tropospheric Duct** and can occur over quite long distances in a stable form, and at greatly varying heights, from almost ground level up to several hundreds of meters. A wave entering this duct will propagate by multiple reflection along it with very low attenuation, being "guided" in a manner somewhat analogous to microwaves in a waveguide....These tropospheric effects are detected on all frequencies but are important chiefly in vhf....."

Page 368 ARRL/Handbook 1956:

"The greater the intensity of ionization in a layer, the more the path of the wave is bent. The bending, or refraction (often called reflection), also depends on the wavelength; the longer the wave, the more the path is bent for a given degree of ionization. Thus low-frequency waves are more readily bent than those of high frequency. For this reason, the lower frequencies - 3.5 and 7 Mc. - are more "reliable" than the higher frequencies - 14 to 28 Mc.; there are times when the ionization is of such low value that waves of the latter frequency range are not bent enough to return to earth." On the same page, Fig 15.3 is captioned "Bending in the ionosphere, and the echo or reflection method of determining virtual height". The text says in part..."The wave

travelling upward is bent back over a path having an appreciable radius of turning, and a measurable interval of time is consumed in the turning process. The virtual height is the height of a triangle having equal sides of a total length proportional to the time taken for the wave to travel from T to R."

On the next page Fig 15.4 is captioned "Refraction of sky waves, showing the critical wave angle and the skip zone. Waves leaving the transmitter at angles above the critical...are not bent enough to be returned to earth.....It is readily possible for the ionospheric wave to pass through the E layer and be refracted back to earth from the F, F1 or F2 layers...."(The figure shows one wave refracted but emerging from the top of the layer and going out into space, and others refracted enough to return to earth after emerging from the lower boundary of the layer.)

ARRL ANTENNA BOOK - don't know the year, but it cost $2, and the 1974 edition was $5, so it was probably in the 50's:

Fig 1.8 caption essentially similar to above ..."Waves entering the ionized region at angles higher than the critical angle are not bent enough to be returned to earth..." The Figure is in the paragraph headed "Refraction in the ionosphere" and starts "The amount by which a wave is bent in an ionized layer depends on....."

MATERIAL PUBLISHED BY CCIR in 1959 referring to chordal hop, whispering gallery, ionospheric ducting, Pedersen Ray:

LONG DISTANCE IONOSPHERIC PROPAGATION WITHOUT INTERMEDIATE GROUND REFLECTIONS - extracts from CCIR/Report 164 (Los Angeles 1959). (This subject is now covered in Report 250):

"There is now evidence from several sources that there are modes of propagation, presumably by means of the regular ionospheric layers, in which waves can travel to great distances by a low absorption path without intermediate ground reflections:

...Oblique-incidence pulses are received in the U.K. by way of a single-hop transmission from Ottawa Canada by means of a high-angle or Pedersen ray. It is improbable however, that the Pedersen mode could be transmitted over much greater distances with widely different ionospheric conditions along the route....

...It has been known for many years that at certain times high frequency communications can be maintained over very long distance paths when the signals are not receivable near the mid point of the route (1955 and 1947 references).

...These considerations all point to the conclusion that the energy must pass through long stretches of the ionosphere without intermediate ground reflections, possibly in the region between the upper side of the E layer and the lower side of the F layer where the absorption would be very low. Rocket measurements show, however, that the trough between the E and F layers can be very small...

...It has been more recently shown that such propagation is also possible within a single layer for certain general types of electronic distribution, the wave reflected down near the level of maximum density being reflected up again from a level near the lower boundary of the layer (two 1956 references)

...It is of interest to note that once a ray has been deflected by a layer tilt into the requisite direction, the possibility can exist of it emerging from the ionosphere and travelling in a straight line path that remains above the earth and re-enters the ionosphere (1958 ref)..

....a series of internal reflections within a layer or region suggests the alternative, or equivalent, explanation in terms of transmission along a leaky waveguide.

This description is particularly illuminating in attempting to explain the characteristics of round-the-world echoes...."

(The cautious language of Report 164 comes from the fact that CCIR Reports are written by committees, and the text gets "softened" until everyone agrees with it.)

NBS Circular 462 "IONOSPHERIC RADIO PROPAGATION" 1948 edition:

..."It is not "reflected" from the ionosphere in the sense that a ray of light is reflected from a mirror; the wave enters the ionosphere, is deviated by refraction, and emerges from the ionosphere....As the upper part of each wave front enters the ionosphere before the lower part, the upper part feels the effect of lowered index of refraction first. Consequently, the upper part of each wave front has an increased wave velocity so that the entire wave front as it enters the ionosphere wheels about like a column of soldiers obeying the command "column right".

***

Isn't that pleasant language to find in the government bible on propagation?

That should be enough to show that ionospheric refraction, chordal hop, whispering gallery, ducting theory has been around quite a long time.

Your fiber optics analogy for possible one-way propagation is pretty convincing, and seems relevant.

Ionospheric propagation modes can be postulated which parallel that situation.

I was commenting specifically on your opinion that one-way propagation "can be caused by differing refractive indexes..".

I agree that the scale is grossly wrong on my chordal hop illustration. But how could one draw it to scale and see it? I wanted to show the layer tilt and the refraction and the chord without taking a full page for the drawing. At least I am not alone - every drawing I have ever seen shows the ionosphere unnaturally high above the earth, and it is difficult to see how it could be illustrated otherwise.

Like trying to draw the structure of an onion to scale. A good example is on page 42 of QST May 1982, in K8IRY's letter about chordal hop. Incidentally he makes the point that you did about the geometry; but the signal does not have to leave the layer at the point it hit it, if refraction is the mechanism. Remember the layer itself is curved, and if refraction curves the signal by a similar amount, the signal will travel parallel to the boundaries. If it is refracted only slightly more, it may travel thousands of miles before emerging; then straightening out, it will soon re-enter again because the layer is curved. You may think it is tedious for me to indulge in all these words, but it is something that many people just overlook when thinking about the geometry.

Similarly, I used the word "bouncing" rather than "going

up to the ionosphere, refracting into along and out of the layer, emerging from the lower boundary and travelling to earth, then reflecting from the earth and doing the same thing over again". "Bouncing", although not in the technical dictionaries, seemed likely to convey the meaning more graphically. I try to write in simple terms where possible. But the existence of refraction does not exclude the possibility of true reflection. Undoubtedly both exist, probably in every case.

I don't know when I learned this, but I am sure it was more than 40 years ago, because I remember giving a lecture about it in Germany about 1947.

I don't know when I became aware of the Pedersen Ray, but will try to trace its origin.

4/3 earth radius IS the standard assumption for path loss calculations for VHF and up. The ray follows a path which is neither parallel to the earth's curvature nor a straight line, but something in between.

Probably HF rays behave the same way, but I don't know whether it has been proven.

To simplify graphical illustration, we draw an earth surface with a radius of 4/3 the true radius, then draw the signal ray as if it were straight.

*****

Fred Laun's mention of antipodal focussing is interesting. The classical paper on this is "On the propagation of short waves over very long distances: predictions and observations" by Hortenbach and Rogler of Deutsche Weller, published in the Telecommunication Journal June 1979.

The abstract of this reads "The propagation conditions of HF signals over very long distances on the short and long great circle paths are discussed. A comparison between the field strengths predicted by the CCIR method and observations for the path Wertachtal-Melbourne indicates that the predicted values are too low by up to 25 dB. It is shown that the high field strength observed can be explained by antipodal focussing and ionospheric tilt-supported propagation."

I quote a little bit of this paper, which was a report on tests carried out over a period of more than 10 years: "Waves entering the ionosphere at very flat angles of incidence will not be refracted back to Earth but undergo a perigee and enter the ionosphere again. This type of propagation has been called chordal-hop propagation. With decreasing chordal length this propagation mode turns into the whispering-gallery-mode which means that the waves are guided along the concave bottom of the ionospheric layer acting as a single-walled duct.

The flat angles of incidence necessary for chordal-hop propagation are possible if longitudinal tilts of the reflecting ionospheric layer exist near both terminals of the link...At dawn the ionosphere undergoes a deformation by an increase of the layer height on the dark hemisphere.

Thereby tilts are created being the prerequisites for initiation and termination of chordal-hop modes.

This type of propagation was first introduced by Albrecht (ref Geofisica Pura e Applicata 1957)."

It goes on to mention the introduction of the equation for antipodal focussing gain into the CCIR prediction methods (I can send you the equation and the derivation if you are interested - it shows infinite gain at the exact antipodal point, so is limited to 30 dB for practical application. Fred Laun will agree the limitation is probably conservative!)

I am relieved to see that they too do not try to separate reflection and refraction. I just had a bright thought, and a look at Webster's. Some of the definitions of "reflecting" are interesting, especially - "the action of bending or folding back".

Looks like an accurate definition of "refracting"!

About the mechanism of ionospheric ducting:

1. If the boundary between one medium and another is sudden, there is reflection.

2. If the ray can enter into the layer, there is refraction.

3. If the ray has impinged on the layer from a very narrow angle YOU ONLY NEED ONE SIDE TO THE WAVEGUIDE, the signal "bouncing" along the inside of a curve.

4. "Ducting" and "chordal hop" and "whispering gallery" may sometimes be different names for the same thing.

I think that authors and illustrators may have been too free with pictures of multiple bounces between earth and the ionosphere, and that it is quite likely that much of our DX communication is carried by paths "without intermediate earth reflection".

But I am sure that many many people have been aware of this probability for many decades.

"Radiosporting" affords a unique opportunity to sound off like this, and it is great fun. (VE7BS).

SUNRISE/SUNSET TABLES

Bob Eldridge, VE7BS

Computer programs for sunrise and sunset calculation use the geographical coordinates of the location, though some will search for the coordinates for you if you give the prefix.

The prefix may be misleading in the case of a country that stretches over several timezones.

Until recently I found it a bit of a nuisance that the gazetteer in my atlas only gave me the page and mapsquare for a placename, making it a two-step process to find the coordinates.

I just bought a new atlas with a gazetteer that gives only the lats and longs for the 35,000 placenames it lists.

It also has a projection showing the world timezones.

Sunrise and sunset are very important for topband operators, and little things like this are worth thinking about if you are going to buy an atlas.

Another useful recent acquisition was a large map of "The New Pacific", which came free from the Department of Planning and Economic Development in Hawaii. It not only shows the location of hundreds of islands in the Pacific, it also gives the names of the new groupings (Kiribati, Tokelau, Tuvalu and all that) and their respective capitals and political status.

Without this map I would never have known just where Pukapuka is, or that there is an island with a name spelled with nothing but vowels (Eiao).

DXpeditioning

WB4ZNH
Carl Henson

8280 Chestnut Dr.
Jonesboro, GA 30326

S79LJ, Bird Island, Seychelles

Ian Shepherd, G4LJF

I suppose it was my two previous DXpeditions to 3B8 that started the story. On both occasions the flight to Mauritius had made a stop at the Seychelles enroute, and each time the magic of the Islands had fascinated me during the short time on the ground there.

When I first inquired about getting a licence for S7, the answer had been an immediate no, as it was a pre-requisite that a Ham had to be resident for at least six months before a Licence application would be considered.

Even talking to S79CW, who was the Ham go between with the Authorities promised nothing, for Clive said that they were adamant that there would be no exceptions to the rules.

However, it was a QSO with Clive that set the ball rolling. He mentioned that G3PEK had been down recently, and that he had been allowed to operate as a guest of S79WHW, as a result of a relaxation of the regulations. So I immediately wrote to the Ministry of Education and Information and made a request for a Licence for the first week of January '87. Wishful thinking perhaps, but much to my surprise I had an answer within two weeks!

It was not good news though as they said that it was not normal to grant permission to non-residents, but they might consider letting me operate from an established station if I gave them more details about my proposed visit.

I wrote back and told them that this was not the way that I was going to do it, as I wanted to use my own equipment from a beach location, and operate when I needed to at all times of the day or night. I also pointed out that it would be very unfair on a resident Amateur to use and perhaps wreck his equipment in a location so far from any form of repair center.

As a final inducement, I promised to publicize the beauty of the Seychelles through an attractively designed QSL card, which would promote the Islands for tourism.

To my surprise, I again got a swift reply, this time granting permission in full, and they even told me that arrangements would be made with Customs at Mahe to ensure a smooth entry with my equipment!

I then set about ensuring that this time I went to the Indian Ocean, I would put out a better signal on the LF bands, as S7 is somewhat rarer on the lower frequencies. So, being in New York a few weeks later, I purchased a Butternut HF2V LF vertical for the 40, 80, 160 meter bands.

There then followed several telephone QSO's with Clive, S79CW, as to which end of the Island of Mahe would make the best QTH without being shielded from the three thousand foot mountains, nor causing too much upset to the inhabitants and other visitors.

Originally I planned to be on the West coast, at a hotel with few possibilities for both antenna location and operating convenience, but then by chance I noticed that Anica Rice was doing a television program on her visit to the Seychelles one night, and so with much interest I watched her singing her praises of Bird Island, a small coral island some sixty nautical miles north of Mahe. Bird was flat as Twiggy, and surrounded by clear blue ocean, with beach bungalows and no TVI etc to worry about!

However, the coast was quoted as very expensive, but surely worth the expense in terms of an ideal QTH. Then another idea struck me. Why not phone up the owner and suggest that in return for a good discount, I promote his island with a few words on the back of the QSL? It worked, and I finalized my plans.

As I would be flying to the Seychelles with my employer, British Airways, I wondered if I could take the promotional idea a little further, so I got in touch with our Promotional Department, and asked if they would perhaps print the QSL cards in return for a plug of our flights there. They seemed to think that such a small outlay would be possible, so with that in mind, I set off to the South, blue seas, sunshine and fantastic beaches.

Just as the government had promised, my arrival was expected, and the Chief Customs Officer appeared with a handful of documents authorizing my importation of my equipment, on the condition of course, that I re-exported it!

As we missed the charter flight to Bird for the day, we went over to the Coral Strand Hotel on the West coast for the night. Shortly before reaching the hotel, I noticed a TH6 in the village of Beau Valon. That must be S79WHW I thought, whom I had spoken to many a time.

Having settled Ursula and David into the hotel, I walked back up to the TH6 and knocked on the door. Bill, although somewhat older than I had imagined, being a young eighty six, gave me a very warm welcome, and showed me into his shack.

Somerset Maughan would perhaps best describe Bill's environment. An old fifties gramophone, piles of obsolete equipment, and of course the steaming jungle of trees surrounding his house. A good location for transmitting to the West though, perhaps his favorite direction being a retired Captain of the U.S. Air Force.

I could have spent much longer with Bill, for he is a really fascinating man, with many spell binding stories about the past, and he also showed me how desperately remote he is from Ham Radio as we know it. No convenient shops for components, coax etc. He really is on his own, and as a result he had dreamt up some very ingenious fixes to problems that would have taken most of us off the air.

The next morning we returned to the airport to get on the daily charter plane to Bird. This was to be Trilander, and I became a little concerned when I was told that my equipment would have to follow the next day, due to the aircraft being overweight. All this way to a remote island, and a day on the air wasted! However, after everyone had climbed on the scales, the equipment

just made it, and we set off on a very cloudy day in the rain to the North.

The flight takes thirty minutes, and I was lucky to get the co-pilot's seat, as Air Seychelles fly with a single pilot crew. There are no radio aids on Bird to guide the plane in so I became a little agitated as the altimeter wound down through 250 feet, and we were still in the cloud and rain. At around 200 feet we saw the ocean, and a little while later I spotted Bird out on the right hand side.

The pilot made a tight circuit around this tiny island, followed by an almost blind landing in torrential rain out on the grass strip which was covered in large puddles. The landing was like coming down a water slide as gallons of water cascaded over the windscreen as the nose wheel forged through the puddles. How anyone flies those aircraft in heavy rain without windscreen wipers I do not know.

The charm of Bird island immediately became apparent with its thatched airfield terminal buildings, and the warm welcome that awaited us, complete with a plentiful supply of umbrellas!

We were shown to our bungalow, whilst a tractor followed pulling a wagon with our luggage in it.

After lunch and a meeting with our host and owner of the island, Guy Savy, my son David and I set about putting up the antennas, dressed only in swim suits, and the refreshing rain helped us complete the task by evening despite the hot temperature and enervating humidity.

By dinner time, the antennas were all properly tuned, and the TS 430 and LA-1000 amp put to work. Unfortunately due to the fact that my bungalow was furthest from the generator house, I was only able to get 300 watts from the amp, but I knew that the location would make up for it.

After dinner I was anxious to see what the Butternut would do on 40 & 80. I was really amazed! Signals were just beautiful both ways, and it was immediately apparent that I was getting out very well too, for there was no need to count reports - just contest style exchanges were easily accomplished, and it was obvious that a lot of people were going to get new ones in the next nine days or so.

My operating policy was to work split frequency, especially on the low bands, for in my view that is where split operation is even more important, as all the stations trying to work you are likely to be in skip with

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each other, and it only needs one lid to transmit whilst the inevitably DX station is transmitting, and you have a wasted or protracted QSO.

Despite being so far away, it was still difficult from my end to find clear listening frequencies, especially on 40 meters, but never the less, there is no doubt that by working split, many more QSOs were achieved than had I done battle with a single frequency or got involved with a painstaking and no doubt tedious list operation.

Although the lists do give the weaker stations a better chance, it is often the case that the MC picks up stations that are completely inaudible at the DX end, thus causing long hold ups and time wasting. This may be acceptable for a resident DX station, but for the DXpeditioner, it is extremely frustrating, as he wants to get on and make the maximum number of QSOs during his very short stay. I guess the argument is best judged by the fact that I made some 1829 QSOs on LF with no help from anyone!

I think the results on LF were enhanced on the first night due to the wetness of the ground, for from the next day on the weather changed very much for the better and with the ground dried out, I believe that there was a slight drop off the performance of the antenna. With that in mind I will double the number of radials from the twelve per band to twenty four for the next expedition. Its true to say that I have noticed an improvement at Hutts Farm too when its wet, but I would have thought that on a coral island no more than a few feet at the most above sea level, that the effect might not have been so noticeable.

Next morning I decided to do something I had not tried before, CW! With a very nervous fist I set upon 15 meters, with less trouble than I had imagined. By working split, I soon found that I could be extremely choosy and work off those that I could hear but not decipher! Those stations that set their call twice were more successful at getting in my log, but as the days progressed, with generous use of the ? in the call, I gradually improved and in the end logged some 700 QQQSOs, and gained a lot more confidence in the use of the CW mode. I even enjoyed it a bit, for it's certainly less tiring on both stations on 80 meters!

Propagation was generally not to good, and after the early morning opening to the States on 40 and 80 had gone, there was little life on any band till around 2 p.m., when a 15 meter opening to Europe began. The early morning path to the U.S. on 40 and 80 was really good with some reports received of 59+20 being given by the better stations on 80 meters!

There was always a conflict of course, for the evening opening to Europe on 40 coincided with the only opening that I had to the States on 20, so I tried to rotate my options fairly around the globe, which no doubt upset some, but I tried to share the fun as best I could to all corners. So next time you wonder why an expedition is not on a band working you when you know its the right time, just pause to consider that from his location, he may very well have prime conditions on a different band at that moment.

The daily routine settled down, and the strain of averaging only three to four hours in bed began to show, but the results on LF were so rewarding, that I pressed on Every night, and tried to sleep on the beech in the morning as best I could. I had my own spot on a beautiful sandy split, where the ocean rolled in the most impressive surf I have ever seen. The colors of the water are hard to describe, but I can only say that frolicking in the surf with not a soul in sight, was very near to a perfect paradise.

Guy and his staff were excellent hosts too, and the cuisine was to a very high standard. The fish was particularly good, as the Island has its own fishing boat, and what we ate was fresh out of the ocean. There was also a farm on the island, and so the lodge was self sufficient in poultry, meat and vegetables, and only household goods and drinks had to be brought up from Mahe on the weekly supply boat.

In the months of June and July, Bird Island becomes a breeding home for over two and a half million sea birds of some fourteen different species. The birds are attracted by the arrival of a multitude of good eating such as sprats, which arrive at that Island at that time of the year as a result of a combination of wind and current direction. Fortunately, they tend to congregate at one end of the Island, and so life does not become too unbearable at the lodge!

Before I left on the trip, John, G3BRD, kindly lent me his 160 m loading coil for the Butternut. Unfortunately, as suggested in the manual, I was not able to obtain a good match on this band, and the TS 430S, being very sensitive to SWR, only gave about twenty watts output.

So I rang Clive, S79CW, and he arranged for me to borrow an ATU from Cable and Wireless. It duly arrived on the plane, and the two nights before I was due to depart, I was ready to try top band.

The first night I heard plenty of people calling CQ from Europe on CW, and I also heard OK3CSC very loudly on SSB, but they were all answering calls from Europeans, so next day I told them on the HF bands to listen specifically for my CQ call.

I really did not think that I would have much success with only 100 watts, but much to my surprise, I worked GI, 4X, PA, LA, 8Q, ON, G, F, OH, W4, and VE1, all on CW. I wish I had tried the band earlier, but alas time was running out and I had to pack up and return home.

On the return flight to Mahe I sat in the co-pilots seat of the Otter. I took out the side window, and shot a whole reel of film as we circled the Island. The best shot I subsequently used for the QSL card.

As I had a day to kill on Mahe whilst awaiting my flight home, I had lunch with Lloyd and Iris who were also in S79 at the same time, and we were joined by WHW and CW. As Clive pointed out, it was probably the first time that five S7 hams had been together for quite a while.

I recently heard that Clive is leaving the Seychelles, so only WHW will remain active, who is getting on these days, and is also is not keen an the low bands. So I guess it would be worth going back to Bird again, perhaps next January when I have leave, although I would like to ski slopes for a change!

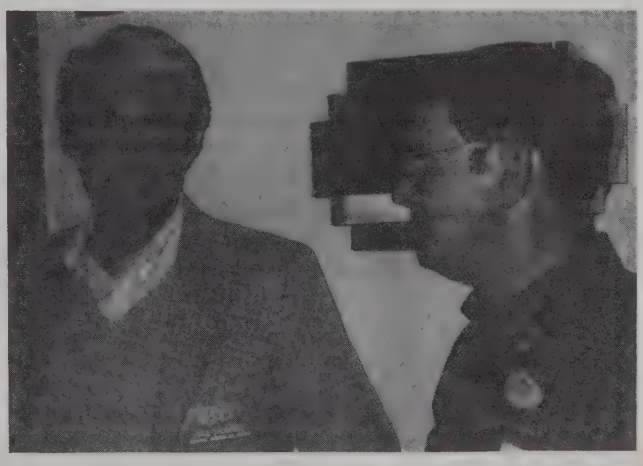
It was certainly a successful expedition though, with 5115 good QSO's being made. An area breakdown shows some 44% of the QSO's with Europe, 18% with N.A., 9% with the USSR, 8% with Japan (almost entirely on 40 & 80), 3.5% with S.America, 4% with Asia, 8% with Africa, 3% with VK/ZL and 1.5% with Caribbean.

The most worked European country was (surprise) Italy, followed by West Germany and then the British Isles.

The big disappointment on my return home was that British Airways decided not to help with the QSL cards, but thanks to help from VS6CT, I managed to find a printer in Hong Kong who did a great job at a very reasonable price in an even smaller amount of time.

To those of you that I worked, I trust that you like the cards, and hope I will have the pleasure of giving you some more new ones from somewhere in the near future. (G4LJF)

Fred Laun, K3ZO and Kjell Edvardsson, SMØCCE



Vince Thompson, K5VT and Bill McDowell, K4CIA

Fighting RF Interference

Part 1

Yuri Blanarovich, VE3BMV

With increasing flood of electronic gadgets we are facing more and more problems of interference to and from variety of electronic appliances. Many manufacturers willingly or unwillingly overlook the potential problems with radio frequency interference. Few years back, manufacturers of TV receivers were arguing that it is not cost effective to put few capacitors or chokes costing a dollar or so in the set because probability of interference from ham radio or CB operator was low. We know how this picture changed, while the same philosophy among the manufacturers remains. More over, we see more RFI prone appliances coming on the market with very poorly shielded cabinets, no bypassing of external cables and leads, quite often clear disregard for the basic rules of good RFI proof design.

FCC and other regulatory agencies could do a lot for reducing the problem of interference by establishing and enforcing the standards of good low RFI design practices. In some areas, like computer products, the manufacturers are subjected to test and approval of their products and in case where there are marginal results, the manufacturers have to include the warning that it is the responsibility of the owner of the computer product to take care of the interference. We see more and more RFI prone products coming on the market, starting with light bulbs and ending somewhere with expensive computers and musical instruments. Many of the products are an excellent receivers/transmitters of RF, even if they are not intended to do so.

The situation is getting worse. On one hand we have "industry" forces pushing for deregulation and easing the requirements to obtain ham radio license (we need numbers to buy our products) on the other hand we are having problems to operate our stations in the residential areas. We are exposed to lawsuits by neighbors using anything but RFI proof appliances. Where is the "industry" in a case like this? Nowhere! It is up to the generous fellow hams with big heart to donate the buck to fight the unreasonable neighbor. Cases like this are mushrooming and we are not winning much, nor precedent setting either.

What are the choices left for us? There are few:

1. The best way to avoid the RFI situation is to buy a piece of land, sufficiently large to keep neighbors at a safe RFI distance. This will almost guarantee the freedom from RFI, while it might give us that superior radio location. This is clearly the best choice for the active DXer and contester. The next best thing is to operate mobile, but who wants to spend his radio life mobiling!

2. If you are forced to live in a residential area, try to find a property that borders on uninhabited area like park, swamp, etc. This can significantly reduce the number of RFI neighbors. Also look for neighborhood with intelligent human beings, it is a lot easier to deal with intelligent people than with morons. Also if there is a cable TV in the area, it is a big help. Try to find a location that has a scarce population density in the directions that you expect to operate most.

3. If you are stuck where you are, you have to make the best of it. That means you have to eliminate or minimize the interference to and from appliances around you. You have to make your own equipment RFI clean as much as possible. You have to RFI proof the appliances around you and your neighbors.

In the following series of articles I will concentrate on the third case, when we are "sentenced" to live among "normal" people having all the RFI prone appliances. I will share some of my experiences and successes over a thirteen year period of living in the residential area, running full power into antennas larger than our lot and setting the 14 world records in the CQ contests, and still being alive to tell about it. Is it technically possible to operate the 2 kW contest station in a residential area? Yes, it is! Is it possible to deal with less intelligent breed of homo sapiens? If you can play a bit of psychology game, to certain extend, yes. In some cases it is a lost cause and it is better (and cheaper) to move or ...

We will start with the most common type of interference and progress to some special cases, while explaining the background of the problem. It is very important to understand the basics of interference generation, propagation and suppression. Once you understand the basics, you should be able to analyze and cure most, if not all, of the RFI cases.

My experience in suppressing the difficult cases in the ham radio environment has helped me to solve the most difficult cases of industrial interference that seemed almost impossible to solve. Quite often just few capacitors placed properly can do the magic. I managed to make computer controller for automatic heat treating line to work 6 feet from a 100 kW RF generator, I tamed 40 kV pulse laser generator to work with computer controlled machine and when I turned on my full Canadian Gallon amplifier, it actually attenuated harmonics coming from the exciter!

In the upcoming series of articles I will start with explanation and definition of RFI problems, we will look at the most effective way of suppressing the interference and look at some special cases including the suppression of unwanted signals in the multi operator - multi transmitter contest station.

Sometimes there is a really difficult problem and bizarre situation. There are many situations that can arise from the combinations of various receiving and transmitting

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devices and we are looking for the description of cases like that. If you have a problem or you came up with a solution, please share your particular experience with us.

Understanding RFI.

Lets look at the receiving side of RFI. We usually need two things for RFI to appear: Receiver and Antenna.

Whenever we talk about the receiver here, we mean radio receiver, TV receiver, toaster, electronic organ, toilet plumbing, anything that is capable of demodulating RF energy. This usually involves intelligent detectors designed to demodulate or rectify RF, but also some least expected ones, like the poor junction of rusted metal surfaces, the reinforcing rods inside of a poured concrete structure. Oxidized and touching metal surfaces can act as a semiconductor - diode, and diodes are known as detectors or demodulators of RF signals. Furthermore, the diode can also generate harmonics of fundamental frequency. This means that you could have a perfectly clean signal on 28 MHz, if there is a poor metal junction in your immediate vicinity, that junction can generate harmonics of 56, 84 MHz and up. So, the receiver can become a secondary transmitter.

The antenna in the RF sense is any piece of wire or conducting object, even your trusted ground wire! Anything that has a physical length longer than a fraction of a wavelength can act as an antenna. A piece of wire 50 cm (19 inch) long is a perfect quarter wave antenna on 2 meter band, even if it is grounded at one end. It can still pick up sufficient amounts of RF energy even at lower frequencies. That wire can be anything, line cord to your toaster, speaker lead between your stereo and a speaker, piece of copper tubing between your toilet and a water meter, concrete reinforcing rod, house wiring and just about anything that is conducting and long enough to pick up RF energy. When we look at the world around us with those RF seeing eyes, we see that just about anything is a combination of the IRx (interference prone receiver) and IAnt (interference collecting antenna), even things that are seemingly or DC grounded. Not a rosy picture!

Modes of coupling.

There are two main modes of coupling or conveying signals from one place to another: Differential Mode and Common Mode.

Figure 1. shows the "normal" way (differential mode) in which a signal is conveyed from one place to another over a two wire cable. The current goes along one wire and returns along the other, flowing in the opposite direction.

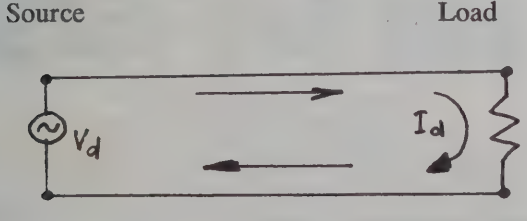


Fig.1

Fig. 2. shows that Common Mode currents flow in the same direction in both wires, and return via other paths - usually other power or data cables that directly or indirectly link the source and load. These are shown in Fig. 2 as a ground connections.

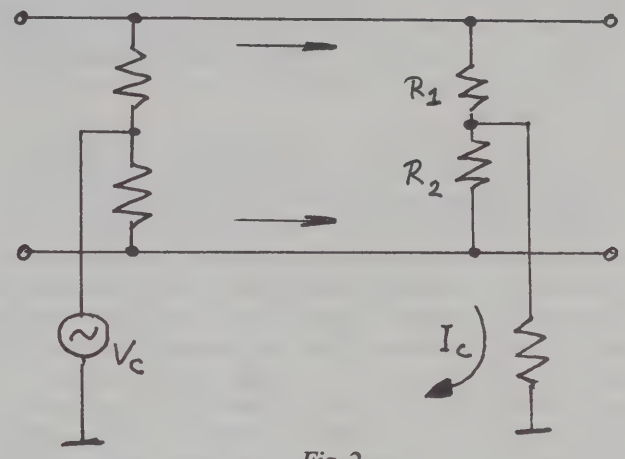


Fig. 2

The Differential Mode is the "designer" mode, we design it to carry the signal from the source to the load. Example is the stereo system and speakers, or transmitter and antenna.

The common mode usually "happens" - the speaker and its leads become an antenna - IAnt, stereo becomes the IRx and the AC power cord and ground connection (capacitance) become the other "wire." We can also look at this system as a receiver in the middle of a dipole. When this system is exposed to the RF signal from our transmitter which has its equivalent antenna - generator - ground circuit in our antenna with its feedline - transmitter - power cord and ground system, we are in trouble. The speaker leads act as an antenna against the ground through the stereo circuits. The current picked up by the leads flows to the ground through the circuit boards of the stereo. There, depending on how clever the design is, part of it can flow through the same path as some amplifier currents. Along the way RF gets demodulated and added to the desirable signal within the stereo amplifier. They both get amplified with a horrible result coming out of the speakers. The war is on! This system can be more sensitive to some frequencies than others, this depends on the length of cables, ground connections, AC wiring layout, etc.

Fortunately the common mode interference is relatively easy to suppress. "All" we have to do is to prevent the RF currents from entering the active device (amplifier). The most effective way of preventing the RF from entering the sensitive circuits is to use the RF choke. We know how effective the choke is in the RF power amplifier. It prevents the high RF voltage from the plate circuit of the amplifier tube from entering the power supply. The RF choke with some bypass capacitors reduces the RF level down to negligible amount. The same we can do in the situation, when the RF is entering the device (IRx) via cables and wires. If we can insert the choke at point where the wires enter the device, we can dramatically reduce the amount of

unwanted RF that enters the IRx.

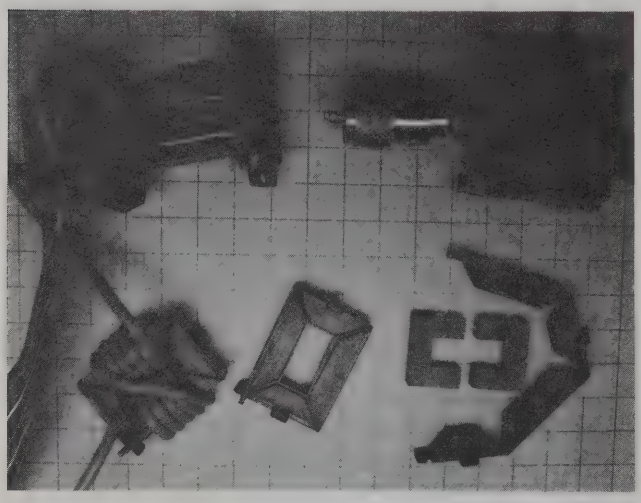
The easiest way to create the RF choke is to use the ferrite material in the form of rod, toroid or core. Here the important factor is the permeability of the ferrite material and frequency response characteristics. Some ferrites, especially those from the old TV sets, might be of questionable quality and desired frequency response. Most of ferrite materials are made for certain frequency band. I.e. AM band antenna rods, TV high voltage transformer, deflection coils for TV, etc. All those are most likely out of the desired frequency range we need to suppress the interference on.

The most elegant device to make the RF choke using the existing cables is the Snap-On-Choke (available from Computeradio, Box 282, Pine Brook, NJ 07058 $12.99 for set of four). It features split ferrite core made of two pieces of U shaped ferrite held together with the plastic clamp. This allows to wind the existing cable on the core, close the two halves and snap the plastic clamp together. The result is the equivalent of toroid core that can be applied to cables and wires without the need to remove the connectors or to unsolder the cables. No warranty is violated, no need to get inside of that precious stereo receiver. The ferrite material used on Snap-On-Chokes is of excellent quality and very rare broad frequency response. It covers the range from .5 to over 250 MHz. This product is definitely superior to other cores (especially the surplus ones) and is very easy to apply and try. If there is need for more suppression, two or more cores can be snapped together to provide more inductance. Very clever arrangement.

I recommend to try this device first, most likely it will clear your problems without getting too "scientific" about it. It will not help alone where there is a problem with harmonics being radiated by the transmitting antenna and picked up by the TV set receiving channel 2. There you need the help of filters.

In the following articles we will look at some typical cases of interference and show how to identify the problem with some suggestions how to cure them.

(VE3BMV)



Samples of Snap-On-Choke and their application to various types of cables.

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MAXIMIZING TRAP VERTICAL PERFORMANCE

Ken Glanzer, K7GCO

(The following discussion relates to radiation efficiency of vertical and shorted vertical antennas. To judge the antenna performance in the real life situation, there is another very important factor to consider: the radiation angle and pattern and how it fits the propagation modes for the desired target locations. Less efficient antenna can produce more signal at the desired angle than more efficient antenna having the nulls in the desired angle. This is important to keep in mind when comparing various antennas especially for the contest operation. More antennas you have, more flexible you are to take advantage of various propagation modes and angles. - VE3BMV)

Here is a summary of the advantages and disadvantages of verticals in general and suggestions for improving their performance. Author contends they have some novel features, although their disadvantages can outweigh the advantages. The purpose of this article is to show how to improve vertical's performance and how to maintain it.

Although I'm not a fan of ground mounted verticals (at least on poor ground conductivity like in Seattle) they do better than most anything else you can install in a limited space. A trap vertical is an effective multiband antenna that has some compromises built in and otherwise.

As a result of some very extensive testing on my part, I have to challenge many of the claims and statements that have been made in the various articles on "current fed, ground mounted verticals" on any ground. The short, loaded verticals with buried radials are even more suspect, as their Radiation resistance (Rr) can get fairly low and the loss resistance (Rl) fairly high. The Rl is much higher in trap antennas due to the aluminum wire in the traps, and helps maintain a misleading low SWR. With a good system of radials some have good success but I've never seen any comparison data. I have assisted in the proper installation of inverted vees and slopers for several friends, and in every case they have come to agree with my findings. I always compare 2 or 3 antennas at the **same time** (I've actually worn out a couple of coax switches) which is a practice many of the vocal do not do.

Improvements

One way to improve any vertical is to **get the base off the ground** and as high as possible. A paper presented at the Dayton Convention Antenna Forum in '87 and '88 by Dr. James Breakhall W3FET/6, described a Mini-Nec computer analysis of an 80 meter vertical antenna mounted at ground level and with 100 buried radials, comparing it to the same antenna with only 4 radials and with the base 15' above the ground (approx 1/16 wavelength). It indicated that the **vertical radiation pattern was the same**! There was a 1 dB dip in the HORIZONTAL pattern (in-between the radials, which could be filled in by adding 4 more radials). It appears the IRE (IEEE now) article by Brown in 1937 on ground radials, sold a large amount of copper wire and has stood unchallenged all this time (he owned Anaconda Copper Co. stock!). If the feedpoint is raised off the ground to 1/8 wavelength, the radials can be angled down at about 30 degrees, which will tend to sharpen the vertical pattern a bit and fill in any horizontal nulls. If you raise the feedpoint of any vertical to 1/4 wavelength, you can reduce the number of radials to 2 or 3, but you should droop the radials down about 75 degrees. Or, just make it an L network, base fed one-conductor 1/2 wavelength vertical (which is the best of all verticals!). The 1/2 wavelength vertical does **not** require any radials, and does an outstanding job in any area Seattle included! The "phase center" is 1/4 wavelength higher up and gives a sharper low angle lobe. If a 1/2 wavelength antenna works so well (even in Seattle), there must be very high ground losses in the radial system and high feedpoint losses in a current fed ground mounted vertical. (See Aug. QST '88 for similar article).

Comparing a ground mounted vertical with any antenna that is "higher" is not always a fair test. So I mounted a 1/4 wave vertical on top of my inverted vee with the lone radial pointing on Japan perpendicular to the inverted vee. The radial didn't interfere with the inverted vee or vice versa. The single radial was at 45 degrees from the mast and was really and "L" antenna. There was some directivity. Even though the L was higher than the inverted vee, the inverted vee still had the edge on the L into JA both on transmit and receive. (I also had three other "L-type" 40 meter verticals pointing at different directions and made many comparisons.)

So what's all this fuss over verticals? **Verticals don't always perform as well as claimed!** (When installed in the built-up area with trees, poles, etc. -Ed.) All this bit about "low loss ground systems" is an **important** factor in **current fed** verticals. Vertical polarization has the highest reflection loss at the low angles, horizontally polarized antennas the least. This loss also increases with frequency. Even if the Rr was 25 ohms and the antenna and radial ground resistance Rl is 25 ohms (25 + 25 = 50 or 1:1 SWR), there would be a 3dB loss in the ground system feedpoint impedance. I have always favored radials above the ground, but they do get in

the way. I buried mine which has been a mistake. There is certainly loss in the buried ground radials, as the ground acts like a dummy load. Ground penetration decreases with frequency, therefore if you can't raise the base have the radials as close to the surface as possible. Ground screens improve performance and the bigger the better. Grass can grow through the screen. Installations on top of metal roof buildings or on top of a metal mobile trailer are very effective and neat. Be sure the connection to the metal roof is of low resistance and all sections are bonded together. Remember, S-meters register radiated and received RF levels at the antenna input not heat generated by the Rl in the receiving antenna. (S-meters are not heat loss measuring devices)!

Many read about the low angle of radiation from vertical antennas and are often severely disappointed unless their antenna farm is on salt water. I get the opposite reaction in letters from users of the 10-90 Degree Top Loaded Vertical, and the K7GCO Modified Hy Tower (See CQ, September 1971 and July 1972). I have never had 1/4 wavelength verticals perform as well as these two, and the modified Hy Tower was ground mounted! The way to test a vertical is with 100W or QRP, not high power. When DX stations break into your QSO's, you know your antenna system is really working. A 1/2 wavelength vertical (full-length or top-loaded) requires **no radials**, and the high feedpoint input impedance has the lowest losses of all antennas! I've brought this fact to the attention of many 1/4 wave die-hards, but they continue to close their eyes to the efficiency and performance of 1/2 wavelength antennas for reasons best known to them. I have been recently comparing 1/4 wavelength verticals to the **high angle quad loop**, and even this antenna receives up to 10 dB stronger than a trap vertical antenna on 40 meters DX. (A simplified version of the Hy Tower modification is being written now and will be published soon).

Books and articles have been written by all the vertical antenna experts on fancy variations of current fed verticals, and with various band switching improvements. There was no mention of the following facts: These "features" did absolutely nothing to correct the main deficiency of high reflection loss of vertical polarization over ground beyond the radial system. The fact that the high reflection loss and low reflection gain (6dB over perfect ground and resulting null for 6-10 degrees above the horizon) is a serious disadvantage. Every test I've run and heard of have shown a 1/2 wavelength vertical without radials will outperform a 5/8 wavelength vertical with radials on 160 through 10 meters and even on VHF mobile. Feedpoint and ground losses are almost non-existent with the high input impedance of a half wavelength vertical. This is certainly not true with a current fed vertical. A **radial system** is **not** needed (or desired) with an **end-fed half wave** vertical, (full-size or top-loaded)! A ground rod **is** needed to "RF-cool" the coax shield. (There is no high angle reflection reinforcement from the radials if there aren't any)! A half wave trapped vertical can be center fed very effectively, but the feedline has to be run at right angles for at least 1/4 wave to reduce interference from the feedline.

I see a corollary of a "loaded" (short) vertical antenna to 35mm cameras. The use of a small negative (and all the massaging they do to it) has limitations of resolution and enlargement size compared to 120 or 4"x 5" size negatives. All the convenience of size and the many accessories make it the most functional camera size. Unfortunately, this does nothing to improve resolution (which hinders enlargement size). As a final note, the 35mm camera manufacturers don't even use their 35mm camera to photograph their cameras for advertisement purposes, they use 120 or 4"x 5" cameras. In antenna performance, convenience, size, and/or fancy accessories are not the main factors in performance. I have persuaded several to install a balun or bazooka fed inverted vee on top of their 75 meter, 60' vertical just for a test and no one ever removed it. They could still transmit in most all directions, and with better reports. Perhaps the radials under the formerly used vertical now used as a support mast helped it even more. It illustrates again that "other than full horizontal or vertical polarization (except over salt water) can often outperform full horizontal or vertical polarization.)

On DX (3,000 + miles) the half wavelength vertical (or top-loaded 1/2 wavelength) is often far more effective than the 1 dB "line of sight" gain it has over a 1/4 wavelength vertical over perfect ground or any ground. I think that enough effort has been put into what I'd have to call "lossy current fed and ground sensitive verticals". If anyone cares to dispute that statement, try a 1/2 wavelength voltage fed top loaded, or full size vertical on 160, 80, or 40 meter band on poor ground. End feeding a half wave with an L-network is the most efficient way to get RF into an antenna, as the Rr/Rl ratio is the highest, it is the least efficient when feeding a low impedance feedpoint.

If at all possible, never install the base of a 1/4 wavelength vertical on the ground with buried radials. Have the feedpoint no less than 1/16 wavelength high. Unfortunately, 1/2 wavelength verticals are twice as long as a 1/4 wavelength (unless top-loaded), and more difficult to make automatically band switching. Elevating the base of a LF vertical creates a construction problem, but is worth the effort. Roof mounting a vertical is ideal, and mounting it in a high tree is even better. Do not mount on a smoking chimney you don't want cancer of the aluminum.

Trap vertical advantages

1. Have low wind resistance, are self supporting (some need ropes), and are easily handled by one person.
2. Operate on 3, 4, or 5 (or more) bands with automatic band switching when fed with a single coaxial feedline.
3. Give low SWR's with fair bandwidth (except on 75 meters).
4. Can be mounted in a tree, on a roof, ground, tower, boat, or camper (with a tip-over mount), or even on top of a yagi beam where it is particularly effective (my first choice).
5. Works fairly well (depending on location).
6. Easy to adjust.
7. No rotator needed.
8. Almost unbeatable when used on/near salt water. Gives the textbook low angle radiation pattern with the

lowest reflection loss (where there is water, there are no buildings or noise makers).

9. Not too objectional looking, and have been hidden in a flag pole or tree. The flag pole can be a 2" or 3" PVC pipe with a cap (keeps antenna clean also). I know of one trap vertical in a power company 3" PVC pipe attached to a power pole. There are no wires coming out the top, and the Power Company pole climbers have never detected this innocent PVC pipe with a new cap on it. He even uses the ground rod the Power Company left when they removed the ground wire that went up the pole. He also buried radials and connected them to the same ground rod. One ham had 5 different flag poles each with a different flag, but the neighbors got suspicious as they all had guy ropes (flag poles never have guys).

10. Can be placed near horizontal antennas with negligible loading effect if the radials aren't too horizontal.

11. Easy to phase together for more gain very effective on DX on 160-10 meters. The sharper vertical pattern of end-fire phased verticals can reduce high angle atmospheric noise. Broadside in-phase phasing helps the horizontal pattern only, but can still reduce atmospheric noise from certain directions. I've noticed a reduction in QSB caused from out-of-phase signals from the sides.

12. Ideal for small lots, and a must as a secondary antenna where it can reduce QSB caused by polarization shift.

13. Ideal comparison, listening and transmitting antenna as it radiates equally in all directions (when that's desirable).

14. Ideal for DXpeditions and Field Day, particularly over salt water where it is the most effective. Unfortunately the disadvantages that follow seem to prevail.

Trap vertical disadvantages

1. Prone to harmonics and TVI.

2. Exhibit directional properties when only 2 or 3 radials are used at angles of 10-30 degrees from horizontal. (Use a minimum of 4 per band on a typical roof mounting).

3. Ground mounting is highly affected by surrounding objects.

4. It's a bit tough trying to bury radials in concrete or black top, which would have to be done before pouring or laying.

5. Trap verticals have less bandwidth and radiating area (about half) on the lower bands than a full-size 1/4 length vertical (narrow bandwidth on 75 meters).

6. Rr tends to be progressively lower on each lower band due to progressive coil loading. The Rl goes higher, which maintains a low SWR but efficiency goes way down.

7. RF spill-over onto mast, tower, and coax shield, causing even more "lift-off" of vertical pattern depending on length and orientation. The first set of radials is not 100% effective in removing the RF from the coax shield or mast. Many "gain" type verticals don't have their main lobe on the horizon. RF spill-over will raise the angle of radiation. The longer the mast the more the lift-off and the higher the angle.

8. More holes in current loop develop as frequency lowers due to coils and shielding effect of the metal coil sleeve, this reduces radiation area (two manufacturers have open coils).

9. Lower efficiency due to aluminum wire in traps, and will tend to heat at kW levels (Rr/Rl ratio too low). Eventual poor connections of aluminum wire to tubing is almost assured.

10. Many joints (each a potential resistance point with corrosion) and structural weak points due to many traps all requiring frequent cleaning.

11. Always have higher noise levels (covering the weak signals) than a horizontal antenna and is also more fatiguing to listen to. They seem to transmit better than they receive, even without the higher noise level.

12. Vertical polarization has the highest reflection loss even on average ground. Has a 180 phase reversal on reflection which creates a null for about 6 to 10 degrees (less on salt water).

13. Verticals are even less efficient on sandy soil.

14. Ground reflections that occur all the way to the horizon beyond the radial system are the most important for the major angle of radiation. Radials actually increase the high angle part of the radiation lobe.

15. Some report that trees (Silver Maple and Ironwood) absorb vertical polarization (it's woodazontal).

16. Each trap has 2 shorted turns in the trap field on each band built in. It raises the resonant frequency slightly, increases losses, and lowers the Q.

17. Some self-supporting verticals are barely self-supporting. A good sneeze would put a bend in some.

18. Traps are frequently resonated 2 or more MHz lower than the band to reduce circulating currents in the trap. This is no sin, but the trap is Xl reactive, and shortening of the antenna a bit is required to compensate. This reduces the current loop area and bandwidth even more.

Reducing disadvantages

(Note: Numbers below correspond to above paragraphs).

1. Use harmonic traps (Nye-Viking Co., Seattle) if TVI is a problem.

2. Additional radials will balance the horizontal radiation pattern and reduce RF spill-over on the mast. No, a wood or fiber glass mast doesn't help since there is still RF current on the coax shield.

3. If it has to be ground mounted, install in the clear and connect coax shield to as many (and long) radials as possible with very shallow burial. When buried, they don't have to be resonant. Over a perfectly conducting ground, a full size lossless 1/4 wavelength vertical has 36 Ohms Rr, so a low loss ground system can actually create some mismatch (1.5:1 SWR) which is desired.

4. On concrete or black top (or dirt), use a voltage fed 1/2 wavelength or top-loaded vertical, which will outperform the 1/4 wave vertical and a radial system is not required.

5. Use an L-network coax tuner in the shack to retain a low SWR for your transmitter on the band edges. Make sure antenna is resonant in the middle of the band or in the

favored area.

6. High frequency radials can be run close to the mast. This gives a higher Rr, longer current loop, more coupling (RF spill-over) to the mast, and coax which raises the angle of radiation. It's a trade off of one for the other.

7. If support mast is high (like on top of a tower), attach a second radial for each band 1/4 wavelength down from the feedpoint on each band on the mast (what a mess of wires all for the advantage of multi-band operation).

8. If you make your own traps, use a stronger insulator and non shielding capacitors.

9 & 10. Replace aluminum wire with same size enameled copper wire, and reduce the number of turns to reduce Rl, install double soldering lugs on each end and add "No-Ox" to the joints. Use stainless steel bolts instead of self tapping screws for soldering lug connections. Use techniques to raise the Rr and increase bandwidth.

11. I know of no way to lower the higher receiver noise levels of vertical antennas, as most noise is vertically polarized. A large RF choke can be attached across the feedpoint for a low resistance DC path for static electricity. On 160 m many use a vertical for transmitting and a horizontal for receiving.

12. Use the single radial "L" configuration (heavy multiple conductor insulated copper wire) to favor a certain direction, or use phased verticals for gain and/or developing F/B. Phased verticals have proven effective on 160, 80 & 40 meters.

Example: I had two 1/4 wave verticals on 160 meters set 3/8 wavelength apart and fed them 90 degrees out of phase. I placed the null toward the loran signal and knocked it down over 30dB. I had about 3dB gain off the front over a single vertical. It was a very effective antenna for knocking out the loran.

13 & 14. Use full size 1/4 wavelength vertical. For maximum efficiency, use a 1/2 wavelength L-network end fed vertical. I find 1/2 wavelength verticals out-perform 5/8 wavelength verticals. No radials are needed for resonance, and feedpoint currents are very low. This virtually eliminates feedpoint ground losses in matching networks. Ground systems aren't needed with 1/2 wavelength verticals.

15. Move to salt water location and avoid Silver Maple and Iron Wood trees, or space antenna next to trees at a "parasitic distance" for reflector affect called a "cone reflector." (Ahem!)

16 & 17. Redesign base with heavy insulator and replace the main bottom section with 1.5" to 2" aluminum tubing and larger base insulator.

18. See section on removing turns and adding copper wire.

19. 1/4 wavelength ground mounted verticals tend to work best with upper SSB. (Just seeing if you are on your vertical toes - Hi).

Basic trap operation

Multi-band operation is accomplished by the use of parallel resonant traps in series with the antenna, placed at the right spot to create a resonant length. When resonant, they form a high impedance and stop RF flow at that frequency. They act like **chokes on that band only.** On the next lower frequency they act mostly as a shielded inductor due to the affect of the metal coil sleeve capacitor on the next higher frequency band. Three traps give 4 band operation. 40 meter operation is obtained just by an extension above the 20 meter trap to complete resonance. It also uses the inductance in the 20 meter trap as well as the others. For 75 meter operation, another type of trap is used to stop the 40 meter RF, and then act as loading on 75 meters.

40 meter choke coil

A choke coil of enough Xl can act as a high impedance to RF, just as a parallel resonant trap (a parallel Xl and Xc). However, the amount of Xl needed can range from 10 to 20 times (100 to 200 uH) the Xl in a conventional parallel resonant trap (10 uH parallel with 50 pF normal for a 40 meter trap). It's not a fixed value as with a regular trap, and it creates a high enough impedance to create a good match and resonance on the desired band. The resonating tip on top is very short to complete resonance on 75 meters (due to the large amount of Xl in the coil). This creates a very high Q antenna, narrow bandwidth, and a much shorter 75 meter antenna than normal with a conventional 40 meter trap. A typical design is a 100 uH choke (which is easy to construct) and will require only about a 5' to 6' tip for 75 meters on the end due to the large amount of Xl. The resonating tip is critical in it's length. One advantage of the 40 meter choke coil is it gives more bandwidth on 40 meters than does the 40 meter trap. If a conventional parallel resonant traps were used instead, the additional length needed for 75 meter resonance is about 22' long, and the vertical would require guy ropes. One could add a trap at this point and run a 22' wire extension to a tree (at right angles, or higher). Fig. 1.

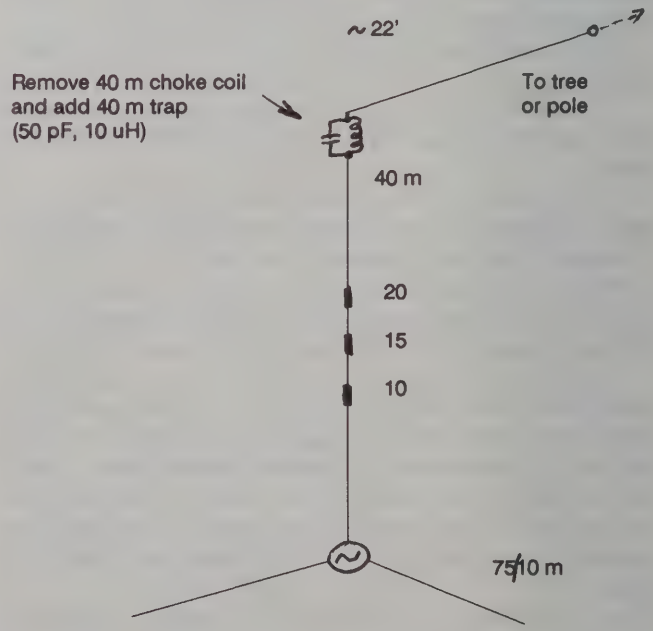

Fig.1

Another technique is to add a 1/4 wavelength of open wire line cut for 40 meters (33.5') and connect as shown in Fig.2. It is its own choke. The antenna becomes an inverted L on 75 meters, but will do a good job and is certainly simple, efficient, and gives more bandwidth.

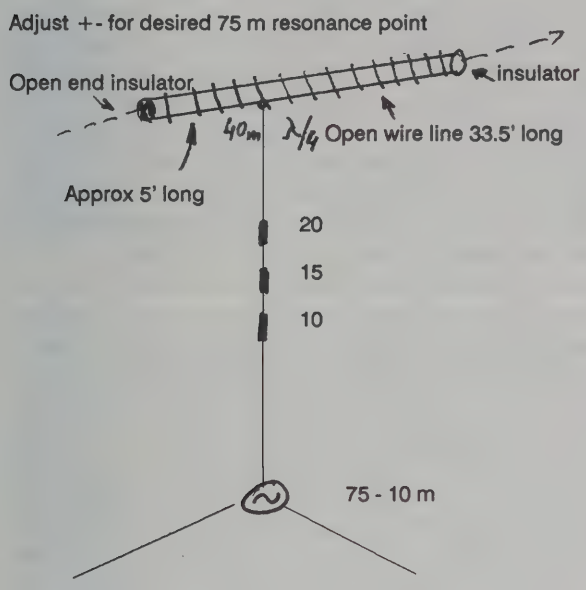

Fig.2

The 40 meter choke coil permits 75 meter operation, and its advantage is to replace the conventional parallel resonant trap (no resonating capacitor). If one should remove the top 40 meter choke coil from the Hy Gain 5 band vertical, the 40 meter resonant frequency will go down. This Xl choke coil (1/4 wavelength away from the feedpoint) actually has a "Xc shortening effect" on the vertical.

Likewise, if you make your own choke coil and resonating stub and add to any antenna for the next lower band, it will raise the resonant frequency about 10%. The amount depends on the percentage of wire in the coil and the length of the resonating stub on the end.

For example: Assume a 40 meter choke coil has an inductance (200 uH). It requires a resonating tip being 4' long on 75 meters. The 40 meter resonant frequency "shift-up" will be less than if the choke had 100 uH and the 75 meter resonating tip were longer. Remember, if the 40 meter coil's Xl is reduced, both 40 and 75 meter resonant lengths also have to be made progressively longer. As this occurs, the bandwidth on 40 meter progressively decreases on 75 meters bandwidth increases. So it's a trade-off of bandwidth from 40 to 75 meters. Since the antenna is getting longer, the current loop is longer on 40 and 75 meters. It would be very difficult to measure any gain difference, but it's a step in the right direction. This choke coil has no set value (like that of a resonant trap) but there is an optimum value for any band (it's like a passive choke). As the choke Xl is reduced, the circulating currents in it increase so progressively larger wire is needed. Check for heating on both bands, and if the coil heats, 2 or 3 larger wire sizes is needed. Even though less wire is used, it has to be heavier. The impedance of this choke goes down, but the circulating currents go up. The amount removed makes room for the next larger size of wire. Leave a 1 kW carrier on for 1 minute and check for a warm coil on both bands. Remember, with low power while receiving, "no heating" doesn't mean it isn't lossy. If it heats on a strong local signal on receive, it is definitely lossy.

As an experiment, I kept removing turns off the two Lattin Lab 200 uH 40 meter choke coils at the ends of a 75 and 40 meter dipole (70' total length), which also has two 4' end wires for 75 meters. I ended up with an 80'- 40 meter dipole up to the chokes, and about 8' end wires for 75 meter resonance. I had to increase the size of the choke wire twice due to higher circulating currents in the process. I gained bandwidth on 75 meters but lost it on 40 meters, so it's a trade-off. I made a 3 wire cage dipole for 40 meter and gained it back, but it didn't increase the 75 meter bandwidth. Further, as the choke coil size decreases, any change to the 75 meter resonating tip also changes the 40 meter resonant frequency some, and to an increasing amount. A parallel resonant trap gives complete isolation between the sections if the 75 meter tip is lengthened. If you feel the 75 meter bandwidth is too narrow on your trap vertical with this choke coil on top, reduce the turns in the coil and lengthen the 40 and 75 meter tips accordingly to retain resonance on both bands. Bandwidth will be reduced on 40 meters however. These are guide lines on how to handle the choke coil.

Bill Lattin of (Lattin Labs) has advertised for years in QST a dipole using the choke coil. It has the advantage of not having a resonating capacitor, which can be a problem at times. However, if the resonating stub is say 4' to 5' on 75 meters, the voltage is so high on the wire tip, it will crack a supporting insulator with 250W. It has to be self-supporting (like the tubing tip on a trap vertical) or hang free with no insulators (as it does on the Lattin antenna). It's VERY sensitive to surrounding antennas also.

Trap modifications

Each end of each trap has effectively 2 shorted turns in its field. This is caused by the open end of the aluminum tubing at the end of each insulator. This reduces the Xl, Q, and increases the losses of the coil. The solution is to slit the end of the tubing for about 5/8" which moves the shorted turn further away from the trap field. The shorted turn concept is known by very few manufacturers, as is evident by the repeated occurrences of this problem in various designs and some "outright disasters" I've seen. I call it "built in inefficiency". A little loss here and there all add up, and the elimination or reduction of it all gives one a little "extra" for digging out the weak one. Three traps thus have six additional loss points that are correctable. With all these "built in losses" plus the resistive loss of each joint over a period of time, many verticals become little more than a "50 ohm resistor stick". When transmitting, some of these resistances seem to short out with power but do not when receiving. Keep a log of accurate SWR curves and check every month. Clean the joints every 6 months, before a contest or any antenna testing. These trap antennas require a lot of maintenance.

Aluminum electrical house wiring has been banned, as

the aluminum would loosen under the screws tension increasing the contact resistance which then heats and creates fires. This type of connection in the traps if further subjected to corrosion and loosening by even minor flexing of the antenna. Spot welding can solve this problem, but is not practical. Reducing the number of turns also moves the tubing shorted turn further away from the end of the trap thereby reducing its shortening effect even more. Replacing the aluminum wire with the same size enameled copper wire reduces losses even more. The use of dual contact points on the end of each copper wire by using two soldering lugs and two SS bolt connections will lower contact resistance and helps to keep it low.

Turns removal

Hy Gain traps are resonated below the band to reduce circulating current losses since they don't have to be resonant in the band. This is contrary to what books infer or suggest. This fact makes them Xl reactive and requires the antenna to be shortened to regain resonance. Unfortunately, this reduces radiation area, bandwidth and the feed Z even more. I took 2 turns off the 10 & 15 meter traps and 4 turns off the 20 meter trap, and lengthened the antenna accordingly to regain resonance. Remove the aluminum wire one-turn-at-time, starting with the 10 m trap. Lengthen the antenna right below the trap each time to re-resonate in the middle of the band.

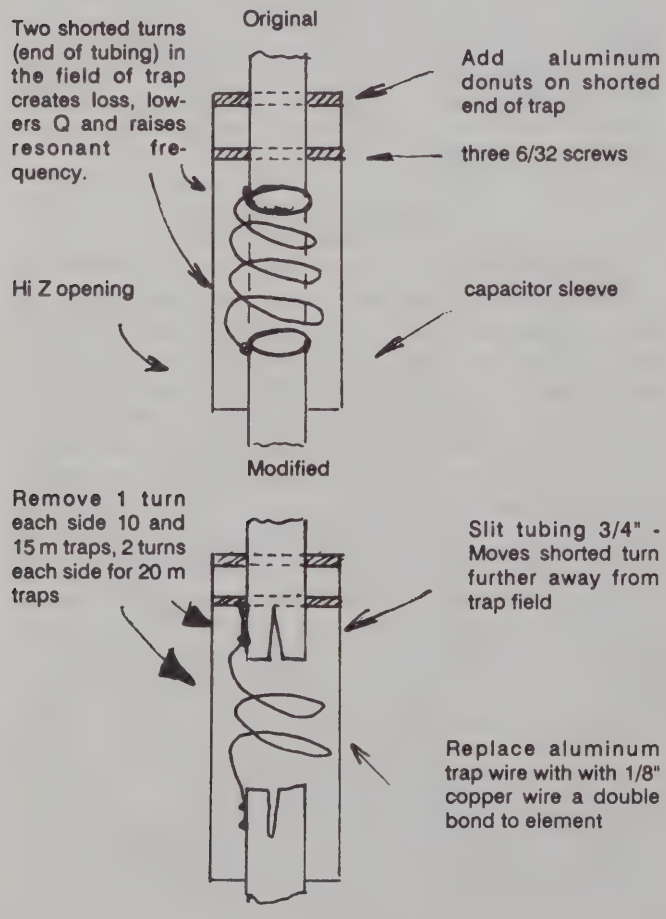
Original
Two shorted turns (end of tubing) in the field of trap creates loss, lowers Q and raises resonant frequency.
Add aluminum donuts on shorted end of trap
three 6/32 screws
Hi Z opening
capacitor sleeve
Modified
Remove 1 turn each side 10 and 15 m traps, 2 turns each side for 20 m traps
Slit tubing 3/4" - Moves shorted turn further away from trap field
Replace aluminum trap wire with with 1/8" copper wire a double bond to element

Fig. 3

Each lengthening minimizes the lengthening needed when removing the turns from the next higher trap. Record and analyze the bandwidth and the 1.5:1 SWR points after each change. Lay the traps on the arms of a wooden chair for support and grid dip at the open end and record their final resonant frequency for future checking. Record the resonant frequency and plot the SWR curve, compare and then do the same with the 15 & 20 meter traps. I write the resonant frequency on the trap sleeve with a vibrator tool. The Hy Gain 20 meter traps normally grid dip at 12.7 mHz. As an example, mine now resonate at 13.5, 20.7 & 28 mHz. You will need larger lengths of l" tubing between the traps depending on how many turns you take off. The slitting of the tubing at the ends moves the shorted turn back from the trap field and lowers the traps resonant frequency.

There are some plastic donuts in each end of the coil sleeve in early trap models. On the shorted end, I installed aluminum donuts for greater strength and lower contact resistance. A lathe is needed to makes these. Later models are swaged down on one end. I have a knurl on the 3/4" tubing under the aluminum donut for a tight fit and coated with No-Ox. I also have three 6-32 SS screws in each donut through the sleeve to hold it in place and retain a good contact. The outer sleeves around the coil are sometimes difficult to get off due to a dimpling in the sleeve. You will have to wrestle with that the first time for removal and remove the dimples for easy removal there after. This is a good opportunity to clean up every contact point and coat with No-Ox if you don't care to make the modifications. I recommend cleaning twice a year and before a contest. Remember every joint is a potential enemy of top performance. Keep the Rl component of R total as low as possible.

Note!!! Do not make these resonant frequency modifications to the traps in yagi beams!! Changing any trap will adversely affect all the critical resonant frequencies and will completely detune your beam! Clean (but do not modify) all traps and telescoping joints in beams.

Someone came up to me after a talk on this "trap clean up" and told me he was going to do a **trap modification** to his **beam**! I just about died when he said that. I hope no one else tries to modify a beam trap.

The L antenna

To improve marginal performance, a directive pattern can be obtained by using only one radial per band. The L is just a tipped and bent center fed dipole. This will give a slight amount of directivity. Point the lone radial in the desired direction of communication. It won't set the band on fire but it will reduce the number calls needed per contact. The single radial connected to the coax shield does not completely cool the coax shield. The coax shield is still hot with some RF and the longer the coax, the more "lift-off" of the free space vertical pattern occurs in addition to reducing any directivity the lone radial creates.

Feeding the L antenna with a 1:1 balun insures the least amount of RF on the coax shield, although RF is still coupled back to the shield by any radial within 60 or less degrees to the mast or coax shield. It's ironic that the radials purpose is to complete the half wave and prevent RF spill-over to the

shield. It then puts it back again on the shield by capacity coupling, depending on how close it is. The amount of RF current on the shield depends on the impedance the shield and mast presents to the RF at the feedpoint compared to the radial since they are both in competition for the RF. A radial tip should be at least 8' off the ground for safety reasons. Actually, the higher the better for the whole antenna if there is no RF spill-over onto the mast and coaxial shield. Try and have the radial between about 20 to 60 degrees down from the horizontal. Available tie points will probably be the determining factor. If the radial is more than 45 degrees from the horizontal, it starts to couple to the mast or coax shield. A single radial L antenna can be made rotatable. It can be another all band trap vertical also.

20, 40 & 75 meters only

If the 10 meter and 15 meter coils are taken out, greater bandwidth and performance may be obtained on 20, 40, and 75 meters. The antenna is much longer with almost a full 1/4 wavelength on 20M. The bottom 6' 1-1/4" section is changed to 12' 1-1/4" 0.058" wall tubing (or preferably larger). This is the maximum length and weight that is easily handled by one person during installation (or testing). Comparisons against an inverted vee and a 1/4 wavelength sloper were better but the latter two still have a definite edge in performance over Seattle's low conductivity ground. The current loop is longer and bandwidth is increased. 10, 11, 12, & 15 meter rods can be spaced around the element at the base.

Tree mounted

High in a tree is an ideal mounting position for a 10 to 40 meter or 10 to 80 meter trap vertical. You should use insulated copper wire for the radials. If the tip of the vertical is at the top of the tree, it lowers the overall height and tends to hide the vertical from the neighbors. Coax is run under the bark near the bottom of the neighbors tree and buried from there to the shack. I know of such installations. An additional radial that is 1/4 wavelength below the vertical feed point and connected to the shield for each band, would cool the coax for even better performance.

Beam mount

The best place to mount a trap vertical is on top of a 40 meter or tribander beam. It uses this already existing and high ground plane and doesn't interfere with the beam. This adds only a slight load to the tower. It provides a supplementary listening antenna and it works surprisingly well on transmit. You can often hear signals on the vertical that you would have missed off the back or side of the beam. On 40 or 75 meters, a radial or two will be needed below the beam, as will be indicated by RF in the shack and/or difficulty of obtaining a low SWR. This is a neat, clean and effective installation.

This fully verifies the "higher the better" concept for verticals also. Be sure to tune the vertical the same as the beam so no or little loading change is seen by the transmitter when switching between them. Some times the vertical will beat the beam under certain conditions and being able to switch between the two is a plus.

Vertical Efficiency

If a quarter wave vertical is shortened by using loading coils from traps and/or choke coils, the radiation resistance Rr will be lower than the theoretical 36 ohms for the full size vertical with the SWR of 1.5:1. Coils have some resistance (Rl) which is higher when the aluminum wire is used for the coil. The RF resistance load Rt at the feedpoint is the sum of Rr and Rl. The Rr can get as low as 10 ohms on 80 meters. If the coils, conductors and radials were lossless, there would be a 5:1 SWR and high efficiency if this 10 ohm value was matched to 50 ohm line with an L network. However since the coils do have resistance and typical trap antenna has SWR values around 1.1:1, this suggests that Rt value is either 40 or 60 ohms and the Rl is 30 or 50 ohms. Either value gives a good match but only the current that flows through the low radiation resistance Rr results in radiation. The current flowing through the Rl creates heat.

The ratio can be around 5:1 in favor of heat. Unfortunately this is a compromise you have to live with in order to get any power into the antenna from the modern 50 ohm output transmitter. Low SWR isn't always desirable but a necessity to get power transfer from the TX to the coax. There is a compensating paradox: more of the loading coil and higher Rl, the shorter the vertical length and lower the Rr, which when added increase the overall resistance Rt close to 50 ohms and making it look better to the transmitter while reducing the radiation efficiency. The Rubber Duckies used on VHF handie talkies have less than 5 ohms Rr and use the resistive wire to create about 50 ohms Rl to provide a good match to 50 ohm transmitter. This allows maximum transfer of power into the unfavorable ratio of Rl to Rr. The efficiency of a trap vertical is somewhere between a full size quarter wave and a rubber duck.

Additional source of losses is in the connections between the tubing, coils and radials. With time each joint increases its contact resistance with little effect on resonant frequency and there is no obvious indication of increased losses due to corrosion. In a trap vertical there are about 50 joints whereas in a full size vertical there are 3 or 4. This is why I call a trap vertical a "50 ohm resistor stick."

I recommend cleaning every joint in the antenna twice a year and just before a contest season. I also recommend rewinding the aluminum wire traps and coils with the same size enameled copper wire to reduce the Rl and use double contact points on each end coated with No-Ox. Reducing the number of turns in each coil will lower the RF losses even more. This is beneficial as the traps are resonant about 10 - 15% lower than the band to reduce circulation currents in the aluminum wire. The antenna will have to lengthened which increases Rr, radiation area and bandwidth. Record SWR values at the resonant frequency and +-100 kHz. Compare weekly. Low SWR is really a sign of higher losses and low efficiency with trap verticals on the lower frequencies. This combined with the high reflection losses at low angles, really takes the performance toll on trap verticals, unless you are in the clear and close to the salt water.

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Observations of

6 m Propagation at Guam

Joel Chalmers, KG6DX

I enjoyed reading VE3BMV's article on propagation. I have seen a lot of strange things here. During the last sunspot peak I was very active on 50 MHz and at 13 deg. N latitude (5 deg. above the magnetic Equator there were a lot of interesting openings. Six meters was open 24 hours a day around the equinox periods. At my location I should not be able to work in the Trans Equatorial (TE) because I am too close to the Equator.

I didn't get the long haul daytime TE the JAs got into LU, and (5B4 and EL long path), but I did get East/West ducting along the middle of the TE ridge with very strong signals from Hawaii (3,800 miles), I worked ZD8 (13,000 mi) on a bent path across Hawaii as well as HC and was heard by ZD7. I was QRO he was QRP and I didn't hear him, ZD8/ZD7 are bent path, (long path) for me. Also, about the some distance South of the Equator H44PT had a same path into FY, TI2 etc. (East/West).

I also had propagation into the PY2AA (13,500 mi) beacon long path into the day time. I think that was normal F2, it was a normal beam heading (SW) and !ong path at night (NW). At night I had E/W path to India (3,700 mi), HS (2,965), VS (2,100) and C5 (10,200) when the DXpedition was there 5-9+20. When the night time TE starts to develop I had a very short opening to the SE into 5W (3,500), C21 (1,800).

Japanese signals came from the NE at about 45 degs. They should have come from the NW about 330 deg. These signals were very strong 5-9++ and as the night got later, they would start swinging westward, until they came from 330 deg - normal heading. This happened quite often. The JA4s would be able to work VK8 on two meters (a direct NS path for JA4 area) every night this path lasted a couple of years past the sunspot peak I believe. Here on Guam I only heard signals up to 100 MHz from Japan and China on the fm car radio.

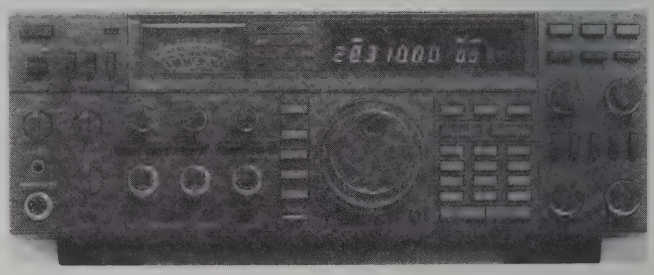
I also had South TE at night into H44, P29, VK (as well as all the VK9s), however I had some holes to the South. I could only work YB (2900) on back scatter pointing NW and openings to FK8 (2,780) only happened about once or twice a year although I could hear the JAs working them.

The TE to VK (2,800-3,500 mi) and JA (1,500 mi) stayed in well past 3 am local time, than just TV sync signals and PY2AA beacon were heard. Some time I could work LU on the long path. The JAs didn't have this path to the NW that I did. However, they worked into KP4, HH, VP2, etc. on the long path across Africa beaming SW, but they didn't have this path on 10 meters! I had a stateside path on 10 meters at that time on the long path, but nothing on 6.

If I am still here for the next sunspot peak I will try to make some tape recordings of this. If you read the books about TE I shouldn't have worked anything because TE is for stations 20-40 degr N or S not where my QTH is. Hi!

New Products

ICOM IC-765
HF Transceiver



ICOM has announced the availability of the new HF Transceiver IC-765. Designed with the most often requested features, the IC-765 combines excellent performance with superb reliability to bring this high performance HF radio. It features :

Direct Digital Synthesizer which assures ultra fast PLL switching and lock-in for excellent PACKET, AMTOR and CW QSK operations

Band Stacking Registers. Each band's VFO's retain their last selected frequency, mode and filter choice. Produces the equivalent of 20 VFO's, two per band. Great for multi band DXing and contesting.

99 Fully Tunable Memories. Store frequency, mode and filter selections. Each one can be retuned and/or reprogrammed independent of VFO operations. Memories 90 - 99 also store split TX/RX frequencies.

CW Pitch Control. An iambic keyer with adjustable speed and weight is built-in to provide total operating comfort and convenience.

Maximum Operating Flexibility. Three step attenuator cuts multi-station overloads. RF preamp pulls weak signals in perfectly.

Built-in AC Supply. 100 percent duty cycle for cool operation and superb long term performance on all modes.

RF Speech Compressor is built in. RF Power Output is adjustable from 10 to 100 W output.

The receiver specifications state improved intercept point of +23 dBm and a dynamic range of 105 dB, utilizing Icom's Direct Feed Mixer. The PLL is said to have low phase noise.

Scaning circuit can scane selected frequency range or memory channels in sequence or as selected.

Fully Automatic Antenna tuner. With built-in CPU and memory for extremely fast tuning and one-touch operation.

10 Hz Readout. Perfect and accurate frequency selection for nets, DX skeds and data communication modes. Large, easy to read display.

Direct Frequency Entry. The desired frequency or amateur band selection can be entered via keyboard.

The IC-765 comes with narrow 500 Hz CW filters included. ICOM's FL-32A and FL-52A deliver razor sharp selectivity. Optional filters include the 250 Hz FL-53A and FL-101.

Available now, suggested retail price is $3149.00.

REAGAN TO BECOME HAM RADIO CONTESTER

Mike Crabtree, ABØX

Most former Presidents upon their retirement from public office spend their time playing golf, fishing, making public appearances, or just relaxing. However, President Ronald Reagan has no such plan for his retirement! It has been learned from reliable sources that the President has been secretly studying for his ham licence for the last several months. Certain well known DXers in a very large DX club in the D.C. area have been tutoring Reagan and a small group of his advisors in the basement of the White House on weekends. It should come as no surprise to most, but Nancy Reagan has been rumored to have been learning the code right along with Ronnie.

This sounds like great P.R. for ham radio, but there's more to the whole story than that. It seems that President Reagan's goal is to build a top notch station on his ranch in California after his retirement. Rumors have it that Reagan wants to keep the First Team intact after his retirement, by applying the great leadership and expertise of his friends and advisors to form a quality Multi-op team for contesting.

Further reports from west coast contest groups seem to confirm this story. Caspar Weinberger was reported to have been seen in a certain well known radio store in California last week purchasing huge quantities of Rohn tower, hardware, radios, and tools. He was overheard to say, "It's just like the government. I have an unlimited budget to buy anything I want to make this contest station!" A source who wants to remain anonymous said that Wienberger marveled at the relative inexpensive price on most tools. He was reported to have said, "Dang! The Air Force bought some screwdrivers like this for over $800!"

It really doesn't take much imagination to see other Reagan advisors in key roles in the Multi-op plan. George Schultz would certainly be at home behind the rig as a multiplier man. His vast experiences in world affairs would make him the ideal choice to keep track of prefix changes, new countries, as well as the expert of the team on grayline openings.

It's reasonable to assume that Howard Baker would be ideal for arranging the operating schedules for the multi-op station, obtaining log and dupe sheets for all contests, as well as sharpening all pencils.

The President's skills should not be overlooked either. What multi-op team in the world wouldn't want to have "The Great Communicator" on their side? His well known voice would be an excellent aid in breaking big pile ups in the DX contests. Plus, his ability to talk fast without really saying anything would be a great help to any multi-op team!

Yet, it was rumored that the President at first was unwilling to work any communist aligned countries in the contests. However, George Schultz was able to convince Reagan of the need to do so. Schultz was overheard to say, "Working the Russian Republics would be a great gesture of world peace plus we might have those multipliers to be competitive.

However, the rumors out of Washington indicate that Nancy is the real impetus behind the whole concept of building a multi-op contest station and will most likely be the station manager. Nancy was rumored also to be the best student of the team in their weekend sessions held by tutors from the DX club. One source close to the project said that Nancy had stated that she couldn't wait to start running JA's!

Confirmation of such rumors always is a problem when dealing with public officials. However, the Young Republican DXers of California have confirmed that they have volunteered to do all the tower work for the Reagan Team. Only time will tell if the rumors are valid, but don't be surprised if you hear a new 6 land contest station in the coming DX contest and the voice at the mike sounding familiar!

Reported by ABØX who takes no responsibility for the validity of the rumors reported in this article. (ABØX)

IF RADIOS COULD TALK

Thorsten Balk, H5AI

Hi. I am a 5 tube SW set, British made and proud of it. Have heard the world, good and bad news. Shh! Here comes Groucho, good ol' knuckle fingers. He thinks of himself as a DX-Fox. Ha! I do all the work here. Slam he turns the ON button. Ahh! I feel electrons running through my veins. That feels good. I burp up the first audio sputter. I'm humming happily along. Suddenly he jerks me off the band, and races down the scale. Twit! I could do with a drop of oil on my scale rollers, you know. Not a bad guy, that knuckle fox. Not a good-looker with his ugly beard.

He sometimes looks upon me as upon a big stingy insect. I don't like that. He's got loose screwdriver fingers, wears them on a belt-pouch. He helps me when I'm sick, but the pliers worry me. Snap medium wave; snap 19 meters; snap .... Ugh he keeps me busy. Uff finally settled down here. Hum, him, oh yeah, since he put me on a magneto-stabilizer I am a new short wave. Now he tweaks again. Well, I can't do much better you know. 37 years on the tubes is murder. Now he peeks in again on my scale; I'm showing him the best of my parallax-pointer. I know he wishes for one of the fancy number show-off read-outs. Yes, go buy one you nerd. Get

one where the crystal is out miles away.

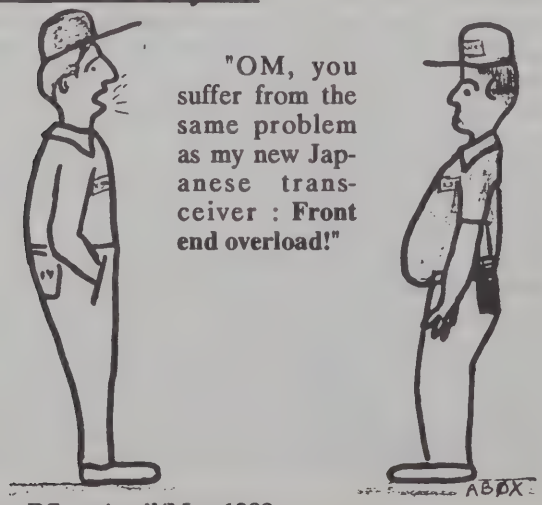
Sensitivity? I'll show you sensitivity! My EF33 is good for 12 microvolts, yes siree. I am pumping more now in the AGC. I'll show him. Ugly program he's listening to. Some Indian music. He loves it, but it is murder on my capacitors. They've got some unbelievable audio range. I am still proud of my band filters. And the speaker, the speaker, wohoo. What a speaker! You must see my magnet to believe me. Boy-o-boy, What a speaker. What a oh oh atmospherics. Here, there, up that high? On band? We live here in one of the thundermost areas of the world. I'll say. I rode out many a storm. Oops. A mains hiccup the magneto-stabilizer isn't removing all, neither are the Irish varistors. Do something, knucklehead! I can feel the oxide peeling off my cathodes. Well, he fitted a neon and a fuse. A neon! A gas-filled bulb! In my innards! What a shame! The noise is getting louder. One day it will zap me. For sure!

Hey, Knuckle-fox, news time. I hum a bit more sarcastically now. That always helped. Hmm, 15 something MHz. BBC news again. (I love that sound). He probably doesn't trust their politics here. That ol' fox. Well, he's got all the world. That's what I'm here for. Oh oh. Back to the Indians. Now that drives me up the grids and screens. Plonk. Change. Now some African music. Humba, humba. That gets my AGC pumping. Oh brother. The double way rectifier is glowing greenish-blue. Haven't had that before. That's all the stuff I get fed here. He has me working hard today.

Whohee, here comes Lady Knuckle-fox. I love her big (zap, kneekle, snerd) whopee. She doesn't like me. Oh, how she hates me, says all the time to Ol' Fox that he loves me much more than her. (I know he does). But he always apologizes, says sweet things, and so it blows over. If she spat on me I would have a melt-down transformer grids and all. Out she goes. Not without giving me another disgusted look. Yeah, go into your kitchen, sweet bee. She's got more electronics there than I've ever had inside.

Back to business now. Rumbling on off medium wave. I'll spit out more atmospherics. Blort. Something wrong now? I stutter along the local show-off. Oh oh. He's sharpening his tweezers again. You'd better check your set of spare tubes. You grouch! He says working conditions are better now because of colored plier handles. Twit! I'll tell him what. Ooops! Must go now. There's something with my humm m m m.

Overheard at Dayton:



V31A Belize horror stories.

Larry Wilson, KØRWL

The news story:

The Kansas City DX Club crew of KØRWL, WØJLC, KBØU, KBØG and friend WB9JKI really burned up the airwaves in the CQ WW CW Contest from Ambergris Caye in Belize. Using the KCDXC call sign of V31A they made 5444 QSOs just during the contest. Their Multi-single effort worked 146 zones and 350 countries for a total score slightly over 6.1 million mark. This excellent score should be very competitive when the final results are all in.

What really happened?

Two days prior to leaving, the mode switch on Larry's TS-830 broke and had to be taped into the CW wide position.

Larry's cat chewed through the Heil mike cord

Larry had his camera batteries replaced at a local camera store, only to find that they were placed positive to positive causing a short.

On the way to the airport, our means of transportation, Rick's station wagon developed a flat tire. This caused the unloading in the rain, of Rick's luggage to obtain tools to change the flat.

The outgoing crew was charged $78 for excessive baggage prior to departure.

Upon arrival, the resort dive shop operator found out besides just being hams, a couple of us would repair his radio and antenna for free.

John's TS-830 would not function just a day before the contest which was found to be caused by a bad 6146, which John would find out still carried voltage on the plate cap.

The switching network for the phased verticals that John had worked so hard on would not function, cause - a loose wire on a switch.

The antenna that Ramon had for us to use was a bent boom and a couple of small pieces of aluminum - problem solved by borrowing a A-3 from a nearby ham, completely rebuilding it and installing it at his home after the contest.

A short in the beam would cause the SWR to rise just prior to the contest, however it functioned well during the contest.

The rotor at the multiplier station stopped working just prior to the end of the contest.

Our direst wiring to the buss for 220 volts at the multiplier station was discovered by an electrician just before the contest, which required the installation of a circuit breaker.

Ramon's cafe was almost entirely Chinese food. which wasn't really too bad, but the prices!!!

Belkin beer was $2 US and US beer wa $4.

One of our group got lost in town one evening.

US Customs met us on the incoming flight in Houston and they weren't pleasant.

Our plane for St.Louis was delayed for two hours due to mechanical problem.

It was cold when we got back

Larry brought back a pleasant surprise from the trip - Belize Jungle Rout (foot fungus).

FCC Official Addresses Ham Club

Arlan Van Doorn, Deputy Chief of the FCC's Washington, D.C. Field Operations Bureau, made a presentation to the *Northern Virginia FM Association* in Falls Church, Va. on January 15, 1989. The NVFMA is one of the D.C. areas largest amateur radio clubs. It has many accomplished members from the high-tech world of defense and telecommunications around Washington.

The Commission's Field Operations Bureau operates the many FCC district offices across the nation and is responsible for enforcement of the many radio communications regulations and international treaties to which the United States is a party. Van Doorn is certainly qualified to speak for the Commission -- he is one of the FCC's top officials for domestic and international enforcement issues and is professionally interested in the welfare of every radio service.

His presentation before the Virginia ham club, however, was strictly personal; he was not speaking officially on behalf of FCC. His talk touched on several subjects ...but of particular interest were his closing comments about the future of Amateur Radio.

Arlan pointed out that when he was 11 years old, a friend of the family who was interested in radio gave him some books, one of which was an amateur book. This friend didn't even have a radio; just some books. But this book got Arlan interested in radio and science and he made up his mind, at 11, to work for the FCC some day.

HAM RADIO AND OUR NATION'S YOUTH

Arlan looked around the audience. "I don't see many young people here," he said. "You are aware of the 220 MHz issue; it was very political. My own glimpsing of what is going to happen is that the Commission is going to take a closer and closer look at amateur frequencies as time goes on. There was a time when you all were growing. You were doing something with the youth of America. It's not happening as much as it needs to."

"I am worried about the American amateurs. You used to have the banner cry that you were teaching people to build radios. This is what Amateur Radio is about. This is what we depended on. Now, you can go out and buy your gear; I don't mind that at all. You may do public service, but Amateur Radio is really a hobby service. It's beautiful that you do public service. You do wonders, you really do."

"But there is not an infinite number of frequencies available, and the demands of this country and of the rest of the world are becoming so great that it is squeezing everything. Everything is having to be looked at. You can't say 'Hey, I've had this and I'm going to keep it.' It doesn't work that way anymore. I'm sorry; times have changed. There are too many requirements and the almighty dollar has a lot to do with it."

"Stop and think. The youth of America are where your ranks are. Amateur numbers are going down. People are dying off. Are there not ways that kids can be shown and taught and helped? You've got an opportunity and I think you're missing it. There is an unchallenged group out there. I used to go to the schools and talk to the kids,and try to encourage them to go into engineering and areas like that. How many of you do that?"

"I've been in the FCC since 1967. In my eyes, the amateur community has been going down in numbers. You may disagree with me that in certain areas it may not be, but I think that overall the numbers of amateurs are going down. I go out and talk to the groups and the average age that I see sitting in the audience is not 18 or 19 years old. There are kids out there that could use somebody that invites them to the house sometimes to see what goes on with Amateur Radio."

"Yes, it takes an effort. We have enough problems in this country with the youth. It is an effort, very miniscule in this great big picture of things. In this country, we have gone over the years claiming that when we get into wartime, this is where the radio operators will come from, this is where they get the training. We're lacking that now."

THE SHORTAGE OF RADIO SPECTRUM

"The Commission made a decision in the 220 case. It was not based upon my opinion as to whether or not there was enough amateur usage there. I had nothing to with that decision. But what I am seeing is that unless you decide collectively in the amateur community to rally forth, I think there is going to be more and more pressure on the frequencies that you have. It is a hobby service, and there are legitimate economic reasons why those frequencies are precious."

"There will be more and more pressure put on you all. If you want to protect the frequencies, your safety is in numbers. Whether it be the youth, the ACLU, the blacks, the Hispanics or anybody else in this country, it's going to be in numbers. The Commission, as does Congress, bows to numbers. Not to one individual, but to numbers. If it takes untold thousands to turn something around, then that's what it takes. But if you don't have the numbers, you aren't going to hack it. Somebody else is going to get in there and put pressure on the Commission to do something else with it."

ON AMATEUR RADIO EQUIPMENT

"It seems like we had a little bit of a problem with Uniden recently. The HR-2510 [ten-meter transciever] is a nice little job. We got a little set of instructions with it [reads instructions to modify rig for unauthorized operation]. We now have an agreement with Uniden. They have now pulled them back, epoxying inside so that modification isn't possible. We run into this [unauthorized modifications] all the time."

Referring to some hobby magazines publishing modification instructions, he said, "We cannot prohibit something from being published. You can put out instructions for anything. It's when somebody does it, or it is being advertised so that we can walk into the shops and they will do it for us, that's a no-no. It's not illegal to have the unit; it's illegal to modify it and use it as such."

"One little goodie that I've been running into that your brethren are using that I find rather offensive is the "roadway equalizer" sound effects gadget. This is the new goodie we're finding now, to take it and stick it on the mike and blast it if you don't like someone's repeater. It bothers me. Amateurs as a whole are a very responsible group, but there are a few yahoos out there, believe me, that you could do without.

"Knowing the amateur rules as you do, you realize that you define good amateur practices. I can't define it, you do. That's what's in the rules: good amateur practice. We are to enforce that. But as long as a problem ham does not cross that line, I have no authority to stop him. The rules are written in such a way -- your League supports them written that way -- you do not want us to be able to do more in certain areas. Therefore the line is there. We don't agree with some of it, obviously, because we'd like to go close some of these individuals down that abuse the airwaves. It gives you a bad name, it really does. Among my people at the Commission, it's most difficult. We may spend hours and hours working on a case, only to have the Private Radio Bureau interpret the rules differently. Trying to enforce good amateur practice is not an easy task."

INTENTIONAL JAMMING

"Now there are some that blatantly step across the line and we go after those. Deliberate jamming is provable and I'm willing to take someone all the way to the mat on that one. We ask for cooperation from amateur groups to tape and to get evidence for us. We try to work closely with them."

He displayed a $9.95 TV jammer device, a commercial unit, on a small circuit board. "Things like this are most difficult to pin down. We get probably 80,000 to 100,000 complaints a year dealing with anything and everything. Someone will get one of these things and decide to irritate their neighbors for a while. We get complaints and go into the neighborhood, but pinning the location down is difficult. We are really interested in going after the manufacturer. We don't have the budget to go after every individual that gets ahold of these."

"This year, the agency's budget is down about $6 million from where we should be. We're on a hiring freeze and we're looking at a furlough of 5 days for everyone in the agency sometime between now and Sept. 30th. It seems that the Congress does not like some of the decisions the FCC has made. It's not amateur radio, it's the biggies: Fairness Doctrine and other things you read about that have the glory."

Congress says, "You want to do it your way? Fine, we'll take care of you." So they cut the budget. The travel money, the money to keep equipment working and to buy new equipment is not there. So we're parking cars or putting them up on blocks.

I can close field offices one day a week, but monitoring stations are manned 24 hours a day, 7 days a week. I have to keep that. They're there in case a plane goes down or a ship is in distress. Truly the safety of life function."

RFI AND PACEMAKERS

"We have put together a guidebook on dealing with interference problems. [This is the multicolored booklet that's been around for a long time and is reprinted, I believe, in either the ARRL Operating Manual or the Handbook.] It's what we mail out if you call us and complain that you're having a problem. We mail one of these before we come out and look at it. The *Government Printing Office* sells them, but we give them out. We find that we can do more good in dealing with the public with this, because it contains information on how to contact manufacturers of consumer products.

We have a dilemma that we are going through right now: when an individual lives next door to an amateur or within a house or two and has a pacemaker. What do we do about it? Normally we don't get into the act until such time as the situation has deteriorated where the individual or the family of the individual that has the pacemaker is no longer able or willing to talk to the amateur next door to try and resolve the problem.

We are told over and over again that the amateur has a God-given right to be on the air. And it seems that the people with the pacemaker have a God-given right that they want to live. The two are not compatible at times. It gets very ugly. We will put an amateur on quiet hours. It may be hard. My feeling is, I would rather put the amateur on quiet hours and say 'You resolve the problem, it is your problem, not mine, not FCC's. You have a problem with your neighbor, work it out.'

Now your League does not like that. I'm sorry. Maybe it's not 'your League', but the ARRL does not like that. For people to get along and live next to each other, there needs to be some way to deal with this. We put in untold hours to resolve it. We're willing to work with people, we bend over backwards to work out a resolution to these things.

So often, it is so hard and it really comes down to the bottom line. If the amateur is put on quiet hours, then it's up to he or she to resolve the problem. Keep us out of it. We don't need to get into it; it's a local situation that needs to be dealt with. It's a flukey problem. The new pacemakers are better than the older ones. You can't pin it down to this or that manufacturer. It doesn't work that way. Nor is it one type of amateur gear versus something else.

FCC JURISDICTION OVER DEVICES

Within the purview of the Commission, those items that generate RF energy, that have an oscillator in it, we get into it whether it be a radio device or some peripheral device. There are many people we have found over a period of time that say, 'I have a patent on this device and I intend to market it for this purpose,' and we'll say, 'Fine, it comes under our purview,' and the guy says, 'I've got nothing to do with you. It's not hooked into a radio, it's for this other purpose.' We say, 'But it can be hooked into a computer, and therefore it does come within our purview.'"

"We get into major fights on this all the time. It's just that the device generates RF energy and therefore we must take a look at it to see if it complies and does not create energy of a nature that would cause interference.

EQUIPMENT SEIZURE

A couple of years ago there was a computer company that went bankrupt in Baltimore. They had an auction with quite a few million dollars worth of [presumably non-compliant] computer equipment. The day of the auction, we went in on a search and seizure and took all the stuff. Ill-timed, but it was our time to go in and do it, so we did. It takes time to get the court order.

Most people don't realize that we don't have authority to seize equipment. If we have to seize something, we have to go to a U.S. magistrate or U.S. attorney and get a search and seizure warrant. Then, we go with U.S. Marshals and we will seize. We take the equipment and we store it in a warehouse. We still have all that computer equipment we seized two years ago, locked up. I have to store it until the case is resolved, so we pay storage on it.

After the case is resolved, seized equipment is returned to the individual it was taken from, if something can be worked out so that it will not be marketed. It can be shipped offshore to someone else, or if we have assurances that it will be modified to our specs, it can then be legitimately sold.

If we end up with it, if the court orders that we keep it, we dump it in and crush it in enormous compactors. It's a shame to see it -- thousands and thousands of dollars of stuff, brand-new Yaesus, Icoms. I also have a 10,000 watt linear down in Atlanta that's going to be crushed. 10,000 watts on 27 MHz.

The *General Services Administration* got very upset with us because we would not turn these items into GSA to be resold. We found that the stuff we would get would not go into legitimate hands. It was going out and being abused again and we would catch it again. We would mark the unit and find it a second time.

PHYSICAL DANGER

Last Thursday morning I had a call from my Engineer-in-Charge in San Francisco -- he had just been assaulted. He had handed some legal papers to an individual who had been in the office before. The individual then hit the engineer, requiring 5 stitches.

As of last year, we in the FCC are under federal protection. We can go through the federal system. Before that, we had to go civil, and go into the local police department and file a complaint as an individual – not as the agency. If you belonged to 4-H, you were protected under federal protection, but the FCC did not have it. I have had my people physically thrown off of vessels into the water, thrown down stairs, shoved, pushed, beat upon. Each time, it was up to our individuals as to whether to file suit and go to the local police. Friday morning, they went out and arrested the [San Francisco] individual. We found that he has a 25-page rap sheet.

The role that we play is if the transmitter is interfering, we go find it. You don't know what's going to be there when you go knocking on the door. It could be the Posse Comitatus, druggies, it could be some 15 year-old. You have a badge and that's it. This is the first assault we've had under the new law. No one has been killed so far. We're very careful in these cases.

It is totally up to the discretion of the engineer-in-charge or the engineer that's going in. If they have any doubt or any fear then we deal with it. We go ask for assistance with FBI or local police if we have the concern that we're going to be walking into something. I just don't see subjecting my people to that. I've been in on many situations where you go into a neighborhood, and you don't know if your car is going to be there when you come back out again. You go knock on a door. You don't know what you're going to find. Sometimes they're friendly and invite you in, and the next thing you know they turn hostile on you.

• The fifth in a series of ***free balloon launches*** by ***Bill Brown, WB8ELK,*** this time carried a small black and white Sony video camera as part of its five pound payload along with the color Elktronics video identifier. Launched January 21st in the Mojave desert community of Hesperia, CA, video was seen over 300 miles away by KD7HH, KS7J and WV7K in Phoenix, AZ. Live video of the Southern California desert area, and curvature of the earth at the edge of space was seen as the balloon rose to its peak height of just over 100,000 feet. The balloon burst when it enlarged to a diameter of 33 feet sending the payload plummeting back to earth. It was spotted by ***Rick, N6UEM*** flying with ***Tom O'Hara, W6ORG*** in an Enstrom helicopter on the desert floor. They were guided to the spot by beam headings from the still transmitting payload. Bill is now considering making his next ballon flight a full ATV repeater.

MORE ON HERB SCHOENBOHM, KV4FZ

We are still getting letters commenting on the controversial amateur operation of ***Herb Schoenbohm/KV4FZ*** of St. Croix, U.S. Virgin Islands. One of the letters received this week charges that Schoenbohm is willfully and maliciously interfering with ...and trying to destroy the 14.313 MHz *Maritime Mobile Net.* Schoenbohm objects to what he feels is illegal international third party traffic.

We were also forwarded copies of two petitions *supposedly* initiated by the *St. Croix and St. Thomas Amateur Radio Clubs* to Virgin Island Police Commissioner Milton Frett where Schoenbohm works as the Chief, Communications Officer. The petitions ask that his "extra-curricular activities" [operating ham radio] be curttailed during working hours.

Frett is quoted in the March 15th *Virgin Islands Daily News* as saying Schoenbohm "...has not violated any police procedures through his transmissions on amateur radio frequencies... and that some of the individuals who signed the petition did not know Schoenbohm, were not licensed amateur radio operators or said they were misled as to the true purposes of the petition. ..Furthermore, the monitoring of the radio freqeuncies has resulted in the interception of many criminal activies ...The most recent was the December 28, 1988, homicide involving William Weatherwax." Weatherwax, now convicted of second degree murder, was one of the individuals that signed the petition to curtail Schoenbohm's ham radio operation!

Schoenbohm, charging the *St. Croix Amateur Radio Club* with defamation of character and libel, has now asked for a newspaper published apology before proceeding with litigation.

MAJOR ARMSTRONG TO BE HONORED!

The year 1990 is a very important year in the history of radio. The date December 18, 1990, marks the 100th birthday of ***Major Edwin Howard Armstrong,*** who was the pioneer responsible for the advent of wideband FM radio and the superhetrodyne receiver, which is used in every modern radio receiver. Because of his life-long dedication and devotion to the research and development of the radio industry, which some major U.S. corporations dismissed as unimportant, he should be properly recognized for his accomplishments in the radio communications field.

All through 1990, ***The Major Armstrong Memorial Amateur Radio Club*** (MAMARC) will be sponsoring events to commemorate his achievements in the radio broadcasting field. The club is seeking other amateur operators from around the world that are willing to research the accomplishments of the Major and to become an official MAMARC Special Event Station that will participate in around-the-world, FM-relayed contacts. These stations will be sent special QSL cards that will bear the callsign, ***W2XMN,*** which was Major Armstrong's callsign for the first experimental FM radio station located in Alpine, New Jersey. These QSL cards would be distributed to other stations as they contact them after each around-the-world FM QSO.

If you are interested in participating in this historical occasion and becoming an official MAMARC/W2XMN Special Event Station, please contact: ***Barry Groupp/N2HDW***, the 100th Birthday Committee chairman with the following information: name, address, callsign, license class and current operating bands. Send this information with a SASE to: ***M.A.M.A.R.C., c/o 100th Birthday Committee, Box 581, Alpine, N.J. 07620***

Courtesy of W5YI Report

PO Box 565101, Dallas, TX 75356-5101

Say You Saw It In Radiosporting

CONTEST RULES

FRANK ANZALONE, W1WY

CQ Magazine

14 Sherwood Road, Stamford, CT 06905

Calendar of Events

May	5-6	Florida QSO Party
May	6-7	MARC County Hunters CW
May	13	Crooked Stick and Rats Nest QSO Party
May	13	Ten Meter Dash
May	13-14	Nevada QSO Party
May	20-22	Michigan QSO Party
May	21	Midnight Special
May	**27-28**	**CQ WPX CW Contest**

Florida QSO Party

0000Z May 5 to 2400Z May 6

The West Palm Beach Amateur Radio Club and Florida Skip are sponsoring the 23rd Annual Florida QSO Party. All amateurs worldwide are eligible and are invited to participate.

Frequencies: Suggested frequencies are SSB 3945, 7279, 14279, 21379, 28479 kHz; CW 3725, 7125, 14055, 21150, 28150 kHz. All amateur bands 160 through 2 meters may be used. No cross-band or cross-mode QSOs and no repeater contacts allowed.

Exchange: Florida stations send signal report and county. Out-of-state stations send signal report and state, Canadian province, or DXCC country.

Entry Class: Florida stations are divided into three classes. Class A stations are those operating portable or mobile using 100 watts or less *output* inside Florida but outside of their home county. Class B stations are any CW stations operating from a fixed location within your home county. Class C stations are any phone stations operating from within your home county. Entrants may be single operator or multi-operator.

Scoring: All Florida stations score as follows. Class A—3 points per QSO, Class B—2 points per QSO, Class C—1 point per QSO. Out-of-state contacts count 2 points for each QSO with a Florida station.

Multiplier: Florida stations count the number of states worked (49 maximum), provinces (12 maximum), and DX countries up to 27 actually worked. Maximum multipler is 88. Out-of-state stations count the number of Florida counties worked (67 maximum).

Awards: Certificates on phone and CW will be awarded for the top station score in each state, province, and DX country. Certificates on CW will be awarded for the top Novice score in each state. Also the top scores in each Florida county will be awarded a certificate. Multi-operator winners will receive certificates as activity justifies. There will be three plaques awarded to: highest scoring Florida station on phone and CW, and to the Florida club with the highest aggregate score. To be eligible for a certificate you must make at least 10 contacts.

Reporting: Use separate logs for phone and CW. Logs must be legible and in chronological order. Entries with over 200 contacts must submit a dupe sheet. The summary sheet must contain Claimed Score, Florida County or State, QSOs, Multiplier Total, Call Used, Entry Class, Power Source of Class A Entries, Florida Club, and Complete Address. The usual signed declaration must be included.

Submit log copies and summary sheet showing all scoring information to: Florida QSO Party Contest Committee, P.O. Box 8194, West Palm Beach, FL 33407. Logs must be postmarked on or before July 4, 1989.

Crooked Stick & Rats Nest QSO Party

2000Z to 2300Z May 13

This fun operating event is designed to encourage Elmering of new Novices and participation by handicapped hams and other interested persons. An article will be written and submitted to *QST*, so bonus points are given for photographs and information about your contest operation.

Frequencies: CW 28.100-28.200, SSB 28.300-28.500.

Power: Limited to 200 watts PEP output.

Exchange: Signal report, QTH, and serial number.

Scoring: SSB contacts 1 point. CW contacts 4 points.

Multipliers: × 2 with an apprentice. Also × 2 if using an antenna built per contest rules. Multipliers are cumulative (i.e., if unlicensed assistant makes an SSB contact using CS&RN antenna, it is worth a total of 4 points).

Bonus Points: 100 points for a newly licensed Novice making first-ever contact; 100 points if operator or apprentice is physically handicapped; 50 points for working all U.S. call areas.

Twenty-five points for description of contest activity or a photograph of antenna, contest operation, or contest group. Note: An apprentice is an unlicensed individual, a Novice or Technician needing assistance getting on the air.

Antennas: To obtain antenna multiplier, antenna must be constructed especially for this contest. No part of this antenna may be more than 20 feet above ground. The antenna must be constructed of no more than 100 feet of wire.

Awards: Certificates will be issued for first, second, and third places for SSB and CW. Certificates will be issued to all entries with an unlicensed or handicapped participant.

Submit log copies and summary sheet showing all scoring information to: Martha Stedman, N7IVX, 15423 SE 7th Pl., Bellevue, WA 98007 by May 25, 1989. Specify names of individuals for special participation certificates.

Nevada QSO Party

0000Z May 13 to 0600Z May 14th

The 1989 Nevada QSO Party is sponsored by the Frontier Amateur Radio Society.

Frequencies: 6 through 160 meters CW, SSB, FM, RTTY, packet, SSTV. Suggested frequencies are CW 15 up from bottom of general bands, phone 25 up from bottom of General phone bands as well as the Novice/Tech bands. No cross-mode or repeater contacts allowed.

Exchange: Nevada stations will send RS(T) and county. Others will send RS(T) and state/province/DXCC country.

Scoring: One point per contact per mode. Multiply points by number of NV counties worked.

Awards: Certificates to top scorers in each state for General and above as well as Novice/Tech. Also to top scorer in each DXCC country.

Submit log copies and summary sheet showing all scoring information to: Jim Frye, NW7O, 4120 Oakhill Ave., Las Vegas, NV 89121 by June 1, 1989.

Ten Meter Dash

1700Z to 1900Z May 13

The Western Washington DX Club is sponsoring its third biennial running of the Ten Meter Dash, spring version. All interested amateurs are invited to participate in the contest.

Frequencies: 28.300-28.500 SSB only. No cross-mode QSOs allowed.

Power: Use 100 watts or less.

Exchange: Signal report and state. Novice and Technician operators also indicate their license class.

Scoring: U.S. Novice and Technician contacts are worth 3 points (including KH6 and KL7 ops.). DX contacts are worth 2 points. Contacts with other U.S. stations are worth 1 point.

Multiplier: Number of states, provinces (VE1-8 and VY1 Yukon), and DXCC countries. New multipliers must be clearly marked in the log.

Final Score: Sum of total points multiplied by the sum of the total multipliers.

Awards: A Western Washington DX Club certificate will be awarded to the top scorer in each state, Canadian province, and DXCC country *when there are three or more entries* from each state, province, or country, or by each ARRL section and continent if only *two* entries are received from those geographic areas.

Submit log copies and summary sheet showing all scoring information to: Andrew Isar, NN7L, P.O. Box 554, Gig Harbor, WA 98335 before June 13, 1989. Contest results will be provided to each entrant who encloses an SASE with his/her entry.

Midnight Special

0300Z to 0500Z May 21

The Overlook Mountain Amateur Radio Club (Kingston, New York) is sponsoring a Midnight Special on May 21st.

Frequencies: 0300-0400Z 40 meter CW, 0400-0500Z 75 meter SSB.

Exchange: Name and first callsign held (example: K5NA would send Richard/KN5PFL).

Scoring: Total QSOs.

Submit log copies and summary sheet showing all scoring information to: OMARC, W2XL, 133 Clifton Ave., Kingston, NY 15238. Results will be published in the NCJ.

CQ WPX CW Contest

0000Z May 27 to 2400Z May 28

Complete rules were in the February issue of *CQ*. Rules and summary/log sheets can be obtained from *CQ* Magazine, 76 N. Broadway, Hicksville, NY 11801. Check the current rules for the current trophy list.

Results WAEDC CW Contest
North America

AB	NL7DU	1,890
AB	**VO7AW**	**24,380**
AB	VE1ASJ	17,264
AB	**K1EA**	**851,580**
AB	**XC8C/3**	**660,231**
AB	**KM3T**	**609,085**
AB	**N6AR/4**	**579,474**
AB	**KZ2S**	**512,244**
AB	**K4XS**	**507,788**
		(Op. WC4E)
AB	**K3IPK**	**375,678**
AB	**N2GZL**	**282,204**
AB	**K2LE/1**	**279,565**
AB	**AB2E**	**170,752**
AB	**K4YKZ**	**168,150**
AB	**K3YGU**	**123,413**
AB	**K5KLA**	**111,696**
AB	**K1ZZI**	**71,680**
AB	**N8BC**	**58,500**
AB	**N5JB**	**27,839**
AB	**W2GKZ**	**16,632**
AB	KC1F	14,768
AB	K1CLN	13,728
AB	K8CV	12,775
AB	AA5AU	10,224
AB	K4FW/8	9,646
AB	W5NR	6,820
AB	W2DW	5,512
AB	K3TX	5,170
AB	K6NA	4,002
AB	W5EIJ	3,760
AB	KC7V	3,657
AB	K1XM	3,430
AB	KQ1F	2,016
HI	**HI8LC**	**10,994**
HI	**VE2LJ**	**95,892**
HI	VE6BF	8,464
HI	**N4RJ**	**182,400**
		(Op. KM9P)
HI	**K5MK**	**32,718**
HI	**N2AZS**	**18,810**
HI	WBØO	10,340
HI	K4FPF	7,840
HI	NQ3S	7,240
HI	N6EK	4,216
HI	K7MM	3,920
HI	N6JM	3,104
HI	WA8ZDT	2,584
HI	KD3JH	1,411
HI	W3ARK	744
HI	W1OPJ	702
HI	AA6EE	252
HI	N6AA	238
HI	W2QYA	204
M	**W3BNA**	**274,992**
M	**N9AG**	**162,800**

Again this month I am pinch-hitting for W1WY, who is recovering from surgery. I apologize for any omissions in the contest calendar, but it is better to be safe than sorry. Starting with the June issue, John Dorr, K1AR, will be filling in for Frank. If you have any ideas or topics for future columns, you might drop John a note.

I was saddened to learn of the passing of Burt Curwen, KL7IRT. Burt was an avid contester and often finished at or near the top in the multi-multi class of the WPX and *CQ* WW contests. In his memory a new trophy has been added to the *CQ* WPX SSB Contest for the top North American multi-multi entry.

Speaking of trophies, there are still plenty of vacancies for trophy donors for all of the *CQ* contests. If you or your club is interested in sponsoring a trophy, contact the contest director(s) for more information. Also, if you are a trophy winner and have not already done so, please take a minute to drop the sponsor a note of thanks. It will be appreciated. If you have questions about past *CQ* WW trophies, K1AR should be able to help you. For the WPX Contest direct your inquiries to me.

To be included in upcoming Contest Calendar columns your information should be sent to *CQ* Magazine, 76 N. Broadway, Hicksville, NY 11801 at least three months prior to the issue that you want it to appear in.

That's about it for this issue. I hope to see many of you at Dayton, and don't forget the WPX CW at the end of the month.

73, Steve, N8BJQ

FCC News

W4GF
Bill Grenfell

7216 Valleycrest Blvd.
Annandale, VA 22003

The Comment date on PR Docket 88-139, Reorganization and Deregulation of Part 97 of the Rules Governing the Amateur radio Service closed November 29, 1988 and the two month period provided for reply comments lasted until January 31, 1988. The American Radio Relay League's comments included an annex which was a complete rewrite of the rules developed by a committee of the ARRL Board of Directors. "A common thread in [the early] comments was that the rules should allow for 'due process of law' rather than FCC administrative sanctions taking without judicial hearings. "The ARRL rewrite took these comments into account and strengthened 'due-process' provisions of the rules." The ARRL commended the FCC on its work to reorganize, modernize and clarify Part 97 of the Commission's Rules. The FCC succeeded in reducing the length of the present rules from 30,073 words to 24,397. The League's rewrite further reduced the length to 17,045 words without eliminating necessary substance by further editing and retaining the basic structure of the rules as proposed by FCC. A 23 page comment on PR 88-139 was filled by a combine by the Radio-Television News Directors Association and the National Association of Broadcasters and "...also representing the views of CBS, Capital Cities/ABC, NBC, National Public Radio, Post-Newsweek Stations, Inc., Reporters Committee for Freedom of the Press and Turner Broadcasting System, Inc." " The media points out that the four-prong standard" [proposed rule section 97,219(f)(1)(2)(3)(4)] unnecessarily restricts amateur operators who wish to volunteer to cooperate with professional print and electronic journalists in disseminating information about important news events who no other voice communications are available to the journalists. "...the proposed language is much too exacting and will inhibit amateur operators from performing much needed roles in news dissemination during natural disasters and other emergencies," they argue. The Quarter Century Wireless Association expressed concern about proposed 97.221 which would provide: "The FCC may restrict operations as necessary to prevent harmful interference." "It was QCWA's impression that meant restricted operation could be imposed without regard to whether the Amateur Radio operator is causing the interference or not." QCWA found much objection to the rule and suggested that "...the Commission accept the responsibility for investigation, on a case basis, of all complaints. "That fact findings be made and published promptly, listing the cause of observed interference and that responsibility for corrective action be clearly defined. (ARRL News Release, ARRL Letter).

John Johnston, W3BE, Chief of FCC's Personal Radio Branch advises of two petitions which have been accepted for comment: "...to authorize Technicians F1B emissions (RTTY, AMTOR and packet radio) privileges in the 80, 40 and 15 meter bands. "(Section 97.61(2) specifically prohibits Novice and Technician operators from using these emissions. RM-6594 "...to move the 80-meter band down to 25 kHz to escape the Canadian phone operation." "A rulemaking number (RM-6595) has been signed to the UPS petition that suggests a band plan for 220-222 Mhz." (W5YI Report).

In response to Congressmen who inquire about the Commission's action in the General Docket 87-14 Order concerning the 220-222 MHz reallocation, the FCC Chairman, Dennis Patrick, has been writing nice things about the Amateur Radio Service and its importance to the community at large and then explaining the allocation status of the 220-225 Mhz band as follows: "Several amateurs have stated that the two megahertz in the 220-225 MHz band represents fifteen percent of amateur international primary frequency allocations between 30 MHz and 24,000 MHz. "Apparently they are including the amateur allocations at 50-54 MHz, 144-148 MHz and 220-225 MHz. "However the 50-54 MHz and 144-148 MHz bands are the only bands allocated on an exclusive basis to the amateur service to this point of the spectrum. "The 220-225 MHz band was allocated internationally to the fixed, mobile and amateur services on a co-primary basis. This band was never intended for exclusive amateur use. "We believe that the Commission's statement in its Order that the 2 MHz represents less than a 2% reduction in amateur spectrum is fair and correct. "In making this statement, the Commission included only amateur bands that are capable of supporting operations similar to those in the 220 MHz region. These bands, which are listed above, provide 128.7 MHz of spectrum to the amateur to the amateur service of which 2 MHz represents less than 2%. (W5YI Report)

"The FCC has again reaffirmed its intention to not certify and new Volunteer Examination Coordinators in the foreseeable future. "There are already 18 VECs serving the continental United States and its possession on a regional basis. "The Commission would much rather see those 18 expand their current operations to take on additional regions. "of the 18, only the ARRL, W5YI and DeVry offer examinations in all 13 testing districts. (Westlink Report).

According to and FCC News Release, Amateur licensee KA1SDR of Fairfield, CT was fined $750 for "pirate radio activity." He transmitted popular music on 7.414 MHz with call letters "CBOR". Unlicensed operation may subject the operator to fines up to $100,000 and/or one year in prison. (ARRL Letter; W5YI Report).

An unlicensed Porter, TX man has been convicted of transmitting obscene, indecent and profane language in the 2 meter amateur band. He was sentenced to three years of supervised probation and fined $1,000. He was also restricted from purchasing or using any radio capable of operation on a frequency for which he does not have an FCC issued License. (Westlink Report)

"The FCC has proposed, in Docket 88-527, to expand the 6-meter repeater subband by 1 MHz, to include 51-52 MHz. This is in response to petitions filed by two southern California repeater groups. Both groups requested the expansion in order to accommodate the growing number of repeaters in the band. "...where there may be no need for additional repeater operations, the spectrum could continue to be available for other types of operation." The FCC noted it was concerned with effect the expansion may have on the present users of that segment ...and invited comments on the need for repeater expansion and its impact.

"The FCC has notified all Volunteer Examiner Coordinators that they will no longer be able to supply FCC Amateur license application Form 610 in quantities of more than five 'because we do not have sufficient resources.' "Instructions for private printing of the forms at VEC expense were included in the Notice from FCC/Gettysburg." (W5YI Report).

The battle to save all of the 220 - 225 MHz band for Amateur Radio in Docket 87-14 rages on! Back in November '88 "...United Parcel Service files a Petition for Rule Marketing, RM-6595, 'to assist Commission in formulation of service rules for the 220-222 MHz frequencies for private Land Mobile use." In filed comments strongly opposing the UPS petition, ARRL said: It is apparent that UPS submitted its petition primarily as an attempt to justify the frequency allocation relative to the appeals, rather than to establish permanent operating parameters for the private land mobile use of the band. "The first half of the petition, for example, makes no reference at all to the specifics of the UPS proposal for implementation of the band, but rather is the statement of alleged justification for the frequency allocation ...the UPS petition is thus no more than an unauthorized pleading submitted with the intent to influence the Commission's deliberation on reconsideration in Docket 97-14." ARRL also pointed out: "The UPS petition, however, seeks to implement a frequency band which may well never be available to the land mobile service. "It will be highly premature, and a waste of the Commissioner's time and resources, to commence a preceding which may be rendered moot by action on any of the more than 500

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reconsideration petitions now on file. "Even assuming,for argument's sake, that 220-222 MHz was ultimately reallocated to both the government and nongovernment land mobile services, Paragraph 57 of the 87-14 Order noted there would have to be a coordinated procedure developed for the band between the two users. "It would certainly be premature to propose and channelization plan prior to the development of sharing arrangements between government an nongovernment services. The ARRL concluding by urging the Commission to dismiss the UPS petition." The League has requested the FCC to schedule oral argument before the Commissioner's on Docket 87-14 The request concluded with: "Oral argument will permit the League to present, in concise fashion, the truth about the effect of the reallocation on the Service and factual data on the subject which has not thus far been adequately conveyed to the Commissioners." (ARRL Letter).

In the continuing crackdown on unauthorized radio use, Kingsville, TX FCC investigators visited several station operators who, when asked, said they were unaware that an FCC licence was required for operation of these stations on frequencies in and around the amateur bands. Now silent, further operation awaits action on station licence applications. (ARRL Letter).

"...FCC has expanded the Special Temporary Authority (STA) for certain unattended HF packet stations to operate until January 5, 1990. "The STA extension only applies to those 75 stations [which] are currently operating under the STA." (ARRL).

At 0001 GMT, 01/30/89 the 17 Meter Band, 18.068-18.168 MHz, was made available for use by USA Amateurs with A1A and F1B emission and with A3E, F3E, G3E, A3C, A3F, F3F, H3E, J3E, & R3E available from 18.110 to 18.168 MHz.

There will be no listings for the states on NC, SC, VA, WV, TN, KY and GA in the 1989/90 ARRL Repeater Directory unless the League decides to reprint the data in the current edition. This is because the huge SouthEastern Repeater association has made good on its threat to copyright its database and no longer supply the ARRL with new and updated repeater listings because of what the repeater council calls "the ongoing dispute that it and other frequency coordinators have had with the League and its stubbornest to consider recommendations concerning listings in the Repeater Directory and recognition of coordinators." A vote of the entire board was taken and the poll was unanimous and was the basis of the group's decision to boycott the ARRL's national directory. (Westlink Report).

The entire 1 1/4 meter band in now under siege in Canada. According to a bulletin from the Canadian Amateur Radio Federation, the Ontario Ministry of Government Services wants 220 to 225 MHz withdrawn from amateur service across Canada and reassigned for exclusive government use. This makes the threat to their entire 1 1/4 m band into one of the biggest ever faced by Canadian amateurs, and it is not only the government that is going after it.

It is the stand of the very powerful Canadian Electrical and Electronic Manufacturers Association that could cause the real problem for amateurs on both sides of the border. While it will be probably mid summer before Communications Canada issues the spectrum utilization study, the proposals mentioned and others will no doubt cause that regulatory agency to look very carefully at the spectrum from 220 to 225 MHz, as well as others, regarding their future as Canadian ham bands. (Westlink Report).

Oral comments by the ARRL before the FCC, and possible open hearings brought by congressional pressure, could result in a reversal of last summer's Commission decision to reallocate 220-222 MHz from amateur to land mobile use. The FCC is expected to grant, if it has not already done so by the time you read this, an ARRL request to present oral arguments before the Commission in the League initiated Petition for Reconsideration filed in the 1 1/4 meter transfer issue. Last October 9, the ARRL filed what is publicly called "a strongly worded petition that accuses the FCC of predetermining the outcome of the original proposal" as presented for public comment in Docket 87-14.

In its filing, the ARRL stated that "in order to justify what clearly was a predetermined outcome to this proceeding, the Commission failed to address the arguments of the Amateur commenters; it extended the reply comment dates after the deadline for filing replay comments without advance notice; it accepted comments of United Parcel Service more than six months after the close of the already extended comment dates because the record lacked support for the position the Commission had already chosen in this proceeding..." This filing on behalf of amateur radio community by the ARRL appeared to present a new, and hard line stand toward the FCC and those who would attempt the theft of amateur spectrum for reassignment for other use. The request to present this view in the form of oral argumentation, probably by ARRL Counsel Christopher Imlay, N3AKD, is yet another point in the resolve of the League to retain 220-222 MHz and all other allocations for use by ham operators.

The ARRL has also carried the 87-14 battle further by filing strong negative comments on RM-6595 - a United Parcel Service request that the company claims to be an action to assist the Commission in the "formulation of rules for the reallocated 220-222 MHz band and to ensure that the much needed spectrum is made available on a timely basis." This appears to be a blatant effort on the part of UPS, and probably other commercial interests, to speed up the allocation process and simultaneously trample under the demands of amateur radio community that this unwarranted theft of valuable amateur radio spectrum be reversed.

In its filing against RM-6595, the ARRL pointed out that UPS is trying to obtain a band that may never be made available to them, nor to anyone else wanting it for land mobile purposes. According to ARRL, it is very much premature and a definite waste of valuable FCC time and resources to begin a proceeding which may soon be rendered moot by action on any one of the more than 500 petitions for Reconsideration on Docket 87-14 currently before the Commission.

Meanwhile, the General Accounting Office has delivered a report on the FCC's frequency allocation policies, especially in regards to the way in which it handled the matter of Docket 87-14, which is very critical of the Commission. Six tests or standards were applied to the FCC in this matter, and in all six cases, the Commission received failing grade. (Westlink Report, ARRL).

The ARRL said YES to expanding the six meter repeater subband down to 51 MHz. The League did this in its filing of reply comments on Docket 88-527. The ARRL said that it completely agreed with the Commission's view that it was desirable to expand the repeater subband but that it was also cognizant of the need to protect operations like the 51.0 to 51.1 MHz DX window. However, the League also feels that through development of a revised band plan, the weak signal operations can easily be protected. Its reply comments concluded by re emphasizing the opinion that the expansion of the six meter repeater subband to include 51 to 52 MHz was desirable and that it can be accommodated on a planned and coordinated basis within the Amateur Service itself without relying on any FCC regulatory restrictions whatsoever.

Scanner labeling rules terminated. After two years of consideration, the FCC has made up its mind about what to do about scanners that receive radio transmissions that are protected by the Electronic Communications Privacy Act of 1986.

Regency Electronics had filed petition asking the FCC amend Part 15 of its rules to require an advisory label on scanners that would caution: "Improper use of this device may violate the provisions of the Electronic Privacy Act of 1986 through intentional unauthorized interception of ptotected radio communications." Regency stated requiring labelling would help educate the public that certain uses of scanners could be illegal in light of the ECPA. Intentional monitoring, particularly of cellular phone conversations, carries stiff penalties. Strangely, cordless phone calls are exempt since the are "easily accessible" Supposedly cellular calls are not - which is nonsense! (W5YI Report)

Amateur Radio Callsigns

issued as of the April 1, 1989

Ar.	Extra	Adv.	Tech.	Nov.
0	WS0I	KF0BV	N0KJD	KB0EFB
1	NV1Y	KC1OA	N1GKL	KA1TMF
2	WN2Z	KE2MA	N2JDT	KB2HLH
3	NU3H	KD3ME	N3GYP	KA3UJR
4	AB4NO	KM4QA	N4VHV	KC4JSH
5	AA5LA	KG5SW	N5ODB	KB5IWZ
6	AA6ND	KJ6RY	N6URD	KC6COG
7	WY7T	KF7SN	N7MMK	KB7HHI
8	WQ8O	KE8XO	N8KNX	KB8GUB
9	WG9L	KE9PH	N9IHE	KB9CID
HI	AH6JT	AH6JT	NH6ST	WH6CCJ
PR	KP4PY	KP4PY	WP4UY	WP4IHS
AK	AL7KY	AL7KY	NL7QW	WL7BUH (W4GF)

Traffic, Emergency

K4ZN
Rev. Chuck Clark

Route 3, Box 800
Moncks Corner, SC 29461

PACKET ZIP

Packet radio offers amateurs an opportunity for rapid, reliable communication everywhere the law permits, and 24 hours a day, once networks of digipeaters are established and the bugs worked out of the system. We will be able to render public service on an unprecedented scale, and it will expedite our own communications as well. With automatic packet forwarding, it will all be done with very little human intervention.

But there's a price. Packet switching networks will require strict adherence to standard message forms, as machines can't be expected to emulate a human operator in figuring out where an incorrectly addressed message should go. There seems to be developing a consensus that the U.S. Postal Service's ZIP code can serve as an excellent basis for routing packet traffic. It's widely known, simple to understand, and divides the country into areas approximating the coverage of the average digipeater.

ZIP stands for Zone Improvement Plan, adopted in 1963 to simplify mail sorting at the post office. Previously sorters had to memorize hundreds of pieces of detailed information before they could sort mail, had to know, for instance, where every small town in their State is located and how to get mail to that town. With the ZIP code, a simple five-digit number gave all the information needed, the first three digits indicating the sectional center where the mail is sorted, and the last two indicating the delivery post office.

And so it appears likely that in the near future anything put into the packet system to be relayed via NTS will carry the routing designation NTS plus the first three digits of the ZIP code, like this NTS294. Traffic entering the system with such a designation will automatically be sent to the station identified as the next relay point en route to the indicated ZIP code.

It's a good idea to include ZIP codes in the addresses of messages anyway, as insurance against garbled addresses and also as an aid for the operators who will have to route the traffic. But now that more traffic will be going by packet, the ZIP code will be more important yet, probably as important as the telephone number.

How we will handle messages addressed to Canada remains a problem, however. Unlike the U.S. ZIP code, Canada's postal code is meaningless to anyone outside the postal service, as far as I have been able to ascertain from inquiring among Canadian amateurs. Even if the Canadian postal code is adopted as the routing indicator, it will require a different program to interpret, as it uses mixed groups of letters and numbers, unlike the U.S. system of numbers only.

(The Canadian Postal code is similar to US ZIP code. It goes even further, it identifies the address down to the street and defines the side of the street. Unfortunate is the combination of letters and number use in the code. While it gives more combinations, it is harder to give verbally. It is easier to give a bunch of number than a combination of letters and numbers. -Ed.)

TRAINING

Any efficient emergency service must be able to handle emergencies as routine. People running around, screaming, wringing their hands don't get things done. People who know what they are doing are the ones who do things. And this is particularly important in an emergency when lives are at stake.

For that reason, firemen, policemen, life guards, EMTs, and others involved in emergencies must undergo continuing training to keep alive skills that they may not have to exercise often enough in real emergencies, but that could mean saving lives when they are needed.

Amateur radio operators who are involved in emergency communication also need training, both initially to acquire the needed skills, and on a continuing basis to make sure the skills remain fresh.

It is really up to the individual amateur to acquire this training. Note that the International Radio Regulations define the Amateur Radio Service as a "radiocommunication service of self-training...," a definition repeated in Section 97.3(a) of the FCC's rules. Emergency coordinators and others involved in preparing the Amateur Radio Service for emergency operation are there to offer assistance, but the primary responsibility for the training rests on us amateurs ourselves.

Just studying to prepare for our license exams is part of the training, but it's only the beginning, and it concentrates more on learning the rules, the code, and the technical aspects of operating radio stations. It's hardly enough to make one an efficient emergency communicator. Ask any emergency coordinator or net control operator who has had to make use of hams without any training who come out of the woodwork during an emergency and want to help. Often the answer will be that they were more trouble than they were worth.

Ordinary day-to-day amateur operating does help to some extent. We learn to operate our station effectively, learn to recognize its strong points and its weak points. We learn the facts of propagation, what bands will be open at a given time to work a given location, or whether there is any chance of working that place at all. If we operate CW we improve our proficiency in using that mode. If we build some of our gear or at least maintain it ourselves, we stand a better chance of being to able to keep it operating when it is really needed. The best school of communication is the contesting. It teaches the effective operating and design of the high performance station.

All of this does help, but more is needed. In an emergency involving a sizeable number of amateur stations, those stations have to know how to work together, and the only way to learn how is through working together. In that way all learn proper procedures, learn to know one another's weaknesses and strengths, and also learn the weaknesses and strengths of the system. Normally this training is in the form of nets. Over the years experience has taught that the most effective way for a large number of stations to work together is by organizing them into a net, whether directed or free. In many cases there is no need for a net control station, but when traffic is heavy and there are many stations involved, it becomes necessary for someone to take control. And so it's necessary for amateurs to know how to operate in a net whether there is a net control station or not.

Then there are the many questions about the details of emergency operation that must be covered, such as proper message authentication, relations with the public and with the authorities, traffic routing, chain of command (who makes which decisions). Yes, there is a lot to be learned and a lot to be refreshed in our memories if we are to be competent emergency communicators.

Is all this necessary? After all, the FCC rules do not require amateurs to be involved in emergency communication. Amateur Radio is a hobby, its purpose is to have fun. That may be our purpose in being hams, but it's not the purpose of the Amateur Radio Service as such. Section 97.1 of the FCC rules does not list having fun as one of its purposes. It does mention emergency communication, however. Maybe we don't expect ever to be involved in an emergency, and there are plenty of other amateurs around to handle it. Well, an emergency is often by its nature something unexpected, and it can happen that any one of us might be the only person on hand to establish communication that could save lives. Will we be ready?

(K4ZN)

Armenia: The Aftermath

Roy Neal, K6DUE

When catastrophe struck recently in the Armenia, some well-meaning amateurs here in the United States began to gather equipment and set up nets to handle health, welfare and emergency traffic. But, in fact, at no time was the earthquake area without communication.

It now appears that the Soviets didn't really need that kind of help, and perhaps those actions resulted in much confusion and even some embarrassment - particularly when a couple of highly qualified US hams went to the Soviet Union and were sent home by the Soviets after only two days.

The ARRL has been criticized for its lack of action. Now, weeks after the disaster we find out that the League was actually maintaining a high level of secrecy while conducting delicate negotiations with the proper Soviet authorities. They set up a dialogue on 14.173 MHz manned by a US amateur in the second call area who has

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requested anonymity. We can tell you that he speaks the Russian language like a native.

In Moscow, the prime point of contact was the Central's Committee's Young Communist League, the official authority handling the disaster.

For the ARRL, the expertise of "Rip" Riportella, WA2LQQ, former president of AMSAT-NA, and a person who has had extensive experience with Soviet amateurs, was utilized. Rip was soon in contact with Leonid Labutin, UA3CR. Leo had been placed in charge of radio communications in support of earthquake relief by the Radiosport Federation of the USSR.

The two set up a communications link using the facilities of the San Francisco - Moscow Teleport, Incorporated. This is a data link normally used by scientists here and in the USSR that uses commercial satellites and ground stations.

It was quickly decided that there was no need to send US operators to Armenia. According to ARRL Executive Vice President David Sumner, K1ZZ, "We never received a request for supplying radio operators because, of course, there was no need for operators to come in from outside. The Soviet Union has tens of thousands of qualified radio operators who speak Russian and thereby talk to one another effectively. And, there was no need to the confusion on-site by sending people from the outside unless they were attached to a relief group going in for some other purpose."

It was quickly found that what the Soviets did need were portable packet radio stations to feed their existing HF link from the emergency area. Working under ARRL sanction, Riportella quickly lined up gear from Yaesu, Tandy and AEA.

Again David Sumner: "There was a need for packet radio equipment. There was at one point perceived by the Soviets a need for packet radio expertise, and we did take steps to line up volunteers to go over to help patch together packet radio network and electronic mail teleport so that they could operate efficiently. But, after a few days, the immediacy of that need seemed to dissipate, so we stood down from that effort."

Sumner said he believes that in the Armenian crisis, everything was done correctly by the ARRL, but he was critical of the League's performance in other recent emergencies such as Hurricane Gilbert.

He went on to say that the ARRL Board of Directors has asked him to study the desirability of adding a new, full time Emergency Coordinator position to the Headquarters staff, so that when an emergency develops the League can move more quickly and efficiently.

There may also be a second position to handle media requests and provide public information as a separate function. He would work with the Emergency Coordinator in a new Emergency Command Po that is a part of the objective of the W1AW restoration project. The command post could be a showcase, even as it handles future emergencies.

(Westlink Report)

(Ed. note: While the bureaucracies "communicated", devoted Glen Baxter, K1MAN and his IARN acted and did something about it! Congratulations to Glen!)

Hams Help USSR During Emergencies

There has been another earthquake in Soviet Armenia and IARN has sent Chuck Sheffer, KJ4TY back in the Soviet Union. Chuck was previously sent home from Moscow but has now been invited back. Victor Goncharsky, UB5WE, is coordinating activities between the US and the USSR and has succeeded in bringing feuding amateur factions together. IARN equipment has been shipped to Yerevan, the capitol of Armenia.

A plan has been presented to the Secretary of the Komsomol Central Committee, one of the top Young Communist League Officials, that will:

Spell out cooperation between IARN and the Soviet Union during international communications emergencies.

Install a permanent IARN link between the US and the Komsomol.

Full recognition of UB5WE as IARN Soviet Director.

UB5WE to have an official position on the Soviet Emergency Committee.

Komsomol to be responsible for IARN equipment while in the USSR.

Soviet IARN to participate in deployment to any part of the world during future emergencies.

IARN to assist Soviet IARN in emergency training.

Chuck Sheffer also carried official charters for international Amateur Radio Clubs in Moscow, Lvov, Chelyabinsk and Ulianovsk. The Lvov chapter will receive the Tandy 1000 HX computer and a AEA PK-232 and has proposed to establish a permanent link between Lvov and IARN headquarters in Belgrade Lakes in Maine. The computer, which required a special export license secured for IARN by Senate Majority Leader George Mitchell, was shipped. (W5YI Report)

An agreement of understanding between the IARN and the Komsomol was signed in Moscow on january 28th. The protocol of objectives sets out the parameters by which the two groups will operate in the event of emergencies. S. Yepifantsey, secretary of the Central Committee of the Komsomol (YCL) is also considering sending a Soviet ham delegation to the Dayton Hamvention and the IARN annual convention in Maine. (W5YI Report)

IARN does it again!

As a result of the recent accord signed between Glen Baxter's, K1MAN, International Amateur Radio Network and the Komsomol in Moscow, USSR, the IARN was requested on February 27 to locate the tall ship Pogoria which had fallen out of contact with its home base.

The ship is on an international good will mission sponsored by the Polish Maritime League with 10 American, 10 Polish and a dozen Soviet boys on board. The IARN became involved half way into the project and as a result was called upon to locate the vessel when other contact was lost. With its worldwide resources, IARN was able to locate the Pogoria quickly and ascertain that no problem existed.

(Westlink Report).

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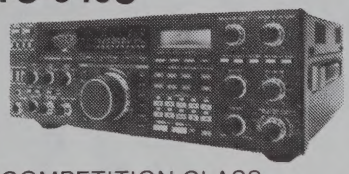

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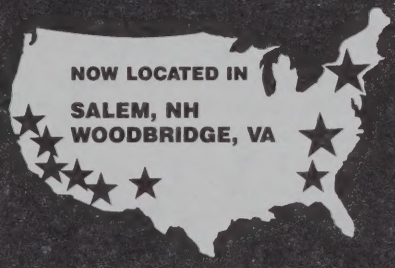

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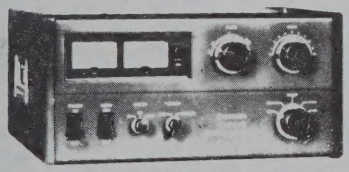

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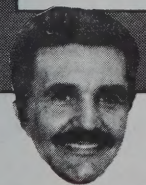

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Purpose and objectives:

1. To promote international friendship and goodwill through sportsmanship, radio contesting and DXing.
2. To improve the quality of amateur radio operators and operating through education and experience, by voicing the opinions of radio amateurs that are experienced and have contributed to the hobby.
3. To promote amateur radio contesting and other operating-related activities as a sport, and to provide the publicity and recognition that it deserves in the public media.
4. To publish timely articles in the monthly magazine RADIOSPORTING, to feature technical articles on equipment design and modifications, antenna construction, radio-wave propagation, and commercial equipment reviews by qualified people.
5. To organize, as an annual event, the "International Contest Symposium," to feature timely topics with the participation of some of the world's leading amateurs at the Symposium.
6. To hold an annual Awards Dinner with an entertainment program, where awards for various achievements will be presented.
7. To maintain and publish all time record tables for significant contests.
8. To sponsor and run an annual World Radio Championship Contest and the DX Century Award program, for working a minimum of hundred countries on single bands or six or more bands.
9. To administer the "Contest Hall of Fame" and vote on awarding membership to those who have significantly contributed to the sport of contesting.
10. To coordinate and assist in the scheduling of international contests.
11. To hold regular weekly meetings on air on 20 and 80 m. (14.200, 3.830)
12. To provide an automatic, computer controlled bulletin station that transmits the latest DX and Contest news on CW and RTTY.(14.098)
13. All in all, the IRSA is dedicated to the pursuit of excellence and quality in amateur radio by promoting, publicizing and leading the way.
14. Attractive numbered membership certificates and badges are issued to members.
15. IRSA is run by contesters who are selected for their accomplishments and it is independent of any national or commercial organizations.
16. IRSA will assist and sponsor Contests/DXpeditions, Trophies and other radio sporting and publicity events.
17. IRSA is a non profit organization, with all proceeds to be used to finance events and awards sponsored by IRSA and to cover expenses incurred by Association.
18. IRSA members can display the IRSA logo on their QSL cards and correspondence; members agree to obey the Contester's Code of Ethics and to promote it.

The initial fee to join the IRSA is US $9; it includes the cost of a certificate and a badge ($4 without the badge). The yearly membership dues are US $4. (Or 22 and 10 IRCs resp.)

Honorary Life Membership will be awarded to those who significantly contribute to IRSA and the sport of contesting.

Members are entitled to be elected and to elect officers of IRSA. They will also enjoy many services and privileges offered exclusively to members.

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